RICE,
DIETARY CONTROLS
and
BLOOD PRESSURE

FRANCES I. SEYMOUR, M.D.

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Central Food Technological Research Institute,
MYSORE.
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RICE, DIETARY CONTROLS AND BLOOD PRESSURE

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WITH

MENUS AND RECIPES

by

FRANCES I. SEYMOUR, M.D.

CENTRAL FOOD TECHNOLOGICAL RESEARCH INSTITUTE, * MYSORE. *
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FRANCES I. SEYMOUR

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PREFACE

A couple of years ago time caught up with me. Right in the midst of a busy and somewhat hectic existence, I found myself forcibly bedded down with hypertension. That gave me lots of time to think.

Then when my doctors assured me that I would live, and after I decided I wanted to live, how to accomplish this became the question of the day.

The routine treatments, by all the top practitioners, produced no glowing results. The only solution seemed to be the rice diet, about which I had already heard a little.

Inquiry disclosed that the principal place in which it was used was at Duke University, under the aegis of Dr. Walter Kempner. In due time I found myself in Durham, joining the "guinea pigs," as the Ricers called themselves. One hundred days of strict adherence to that diet—that was the sentence meted out to me.

I found the whole set-up puzzling. Many people had come there ready to die. Their own physicians had given them up. They decided to try the rice diet as a last resort, not that they really expected to benefit from it, but because they wanted to feel that they had "tried everything." But then, strange to say, most of those whose deaths had been predicted did not die. They improved slowly, but surely, and many of them were able to return to their former occupations, if they slowed their pace a bit and continued to watch their diet.

What was it that produced these results? Was it possible that all these people, including myself, had been mistakenly diagnosed? No, that could not be! Then what was there in rice to produce this effect? Was it the diet, the group spirit, the constant supervision, the change of environment, the climate? Was it a combination of these? Or was it some as yet undiscovered factor that produced these results?

The more I studied the problem and discussed it with others, the more I realized that they, too, had been asking themselves the same questions. I resolved to record my impressions; yes, I would write them down. I would collect them, bind them together, and give them to others in the same boat.

But how could I reach those who needed this knowledge? True, I already knew quite a few people interested in this information, but how could I reach strangers and those in far-off places?

"I'll write a book. That's what I'll do." In that way, every sufferer everywhere would have the benefit of what I had learned.

Those who discover the possibilities of the diet in time may be able to avoid the searing experience of a stroke, cardio-circulatory collapse, or kidney failure. To those already suffering from these diseases, a new hope should be born from the knowledge that the progression of the disease can be halted, and to a considerable extent, the process reversed, provided the patient follows the advice given herein, while remaining under constant medical supervision.

Once the writing of the book was decided upon, the rest was simply a labor of love—hard work, it is true, but comforting in the thought that it might be welcome to many who would not be likely to get the facts in any other way.

Months of material-collecting followed. Then it all had to be whipped into shape. I decided it must serve the needs of both the sufferers and the medical profession which counselled them.

But there was the rub. What should be included and what left out? On the one hand, it seemed that a certain fact should remain because the physician would expect to find it there, but on the other hand, it seemed best to omit it because it was too abstract and theoretical for the patient. What to do in these instances? And so it went until a tome of original compilations and source material was whittled down to the bare necessities of service to both physician and patient.

As the text will show, much of our knowledge is still in a state of flux. Time will have to add many new tools and many new skills to our armamentarium before a well-forged chain of treatment can be established.

We trust, however, that what the reader finds in the following pages will not only be helpful, but will fill his needs, whether he be sufferer or scientist, patient or physician.

FRANCES I. SEYMOUR

February 1951
Nesconset,
Long Island, N. Y.

INTRODUCTION

THE NECESSITY FOR AN EXAMINATION

To embark on any strict diet always has an element of danger in it, and to embark on the rice diet is an especially dangerous proceeding for the patient, or Ricer. It is for this reason that your physician will not allow you to start on the rice diet before you have undergone a series of tests, which will probably take from four to five days.

But even before beginning the tests, your physician will take a complete history of your past illnesses, operations, allergies, emotional strains and family history. This puts him in a position to weigh the influences so far exerted on your life by hereditary factors, as well as the environmental influences.

Then you will undergo a complete physical examination; this will reveal the present status of your physical well-being. It will reveal any destructive forces at work, and any existent conditions which may need medical or surgical attention.

First, there is the matter of your weight. The normal weight table, published by the Metropolitan Life Insurance Company, indicates what your weight should be, for your age and height. Hundreds of thousands of people were weighed and measured and these figures represent the *average* arrived at. Under the careful guidance of your physician, you should reduce, or gain, until you approximate these figures. Insurance companies consider people who are overweight or underweight poor insurable risks, but the medical profession accepts 20 pounds above or below these figures as being normal.

WHAT YOU SHOULD WEIGH

M E N

Height	19 Yrs.	20	21 22	23 24	25 29	30 34	35 39	40 44	45 49	50 Over
5′ 3″	129	130	132	133	135	135	133	131	129	128
5′ 4″	133	134	136	137	139	139	137	135	133	132
5′ 5″	137	138	140	141	143	143	141	139	137	135
5′ 6″	141	142	144	145	147	147	145	143	141	139
5′ 7″	145	146	148	148	151	151	149	147	145	143
5′ 8″	150	151	153	154	156	156	154	152	150	148
5′ 9″	155	156	158	159	161	161	159	157	155	153
5′ 10″	160	161	163	164	166	166	164	162	160	158
5′ 11″	166	167	169	170	172	172	170	168	165	163
6′ 0″	172	173	175	176	178	178	176	174	182	169
6′ 1″	178	179	181	182	184	184	179	177	177	175
6′ 2″	184	186	188	189	190	190	187	184	182	181
6′ 3″	190	192	194	195	197	197	194	191	189	187

W O M E N

5′ 0″	114	115	115	116	117	120	119	118	117	116
5′ 1″	116	117	117	118	119	122	121	120	119	118
5′ 2″	119	120	120	121	122	125	124	123	122	121
5′ 3″	122	123	123	124	126	128	127	126	125	124
5′ 4″	125	126	127	128	129	131	130	129	128	127
5′ 5″	129	130	131	132	133	135	134	133	132	131
5′ 6″	133	134	135	136	137	139	138	137	136	135
5′ 7″	137	138	139	140	141	143	142	141	140	139
5′ 8″	141	142	143	144	145	147	146	145	144	143
5′ 9″	145	146	147	148	149	151	150	147	148	147
5′ 10″	149	150	151	152	153	155	154	153	152	151
5′ 11″	153	154	155	156	157	159	158	157	156	155
6′ 0″	158	159	160	161	162	164	163	162	161	160

THE TESTS

BLOOD PRESSURE

Normal blood pressure readings are about 120 systolic (when the doctor first hears the heartbeat) and about 80 diastolic (when the doctor first fails to hear the heartbeat).

But for the age group from 40 to 50, readings of 120 to 160 systolic and 80 to 100 diastolic are now accepted as normal. If the readings are higher than these, the blood pressure should be checked at intervals, to discover whether the pressure is sustained or is due to emotional reactions. If there is a sustained reading of over 160, further examinations should be undergone to decide whether the high blood pressure is due to essential hypertension, arteriosclerosis or other factors.

THE BASAL METABOLISM TEST

The Basal Metabolism Test determines the amount of oxygen you consume—this varies according to one's age, weight and height.

The test is run as follows:

1. The patient should not eat, drink or smoke from 9:00 p.m. of the evening before the test, until after the test is over.

2. The patient should spend the night at the hospital or in the room in which the test is to be given, and remain as quiet as possible on the morning of the test.

3. If more than the usual amount of oxygen is consumed, it is interpreted as probably being a case of hyperthyroidism, an infection, anemia, or some other abnormal condition. If less than the normal amount of oxygen is consumed, it usually indicates a sluggish thyroid, functioning subnormally. The normal reading varies from minus ten to plus ten (— 10 to +10).

It should, however, be kept in mind that a low basal metabolic rate is frequently, though not always, associated with hyper-

cholesteremia (high cholesterol blood content) so that a blood cholesterol determination should always be done with the Basal Metabolism Test.

THE NORMAL URINARY EXCRETION

The amount of urine excreted during the day is much greater than that excreted during the night, which has a maximum excretion of about 750 cc. The normal specific gravity varies from 1.015 to 1.030.

The highest specific gravity recorded to date for a two-hour day specimen is greater than 1.010; the difference between the highest and lowest figures will be at least 20 points. If the specific gravity of the most dilute specimen is 1.005, then that of the most concentrated will be 1.030.

INDICATIONS OF IMPAIRED RENAL FUNCTION

"One or more of the following changes may be noted:

"1. *Nocturnal Polyuria.* The volume of the night urine exceeds 750 c.c. This is usually one of the first and most definite evidences of impaired kidney function (If indications such as nervousness, insomnia, etc., can be ruled out.) A volume between 500 and 750 c.c. is suspicious, and usually indicates impairment. As H. W. Jones has pointed out, a determination of the ratio between day and night urine is especially helpful in interpreting these borderline figures.

"2. *Low maximal specific gravity* of day urine, the highest of the two-hour specimens falling below 1.018. (After concentration tests).

"3. *Fixation of specific gravity,* i.e., lessened variations in the specific gravities of the two-hour specimens. This is a very important sign of renal insufficiency. In marked cases the difference between the highest and lowest specific gravities may be only one or two points. As a rule the level at which the specific gravity is fixed becomes lower as the functional impairment increases and the kidneys lose their ability to concentrate urine.

"Fixation of specific gravity at a high level, near 1.018 or 1.020, may occur in acute nephritis, chronic parenchymatous nephritis, and passive congestion of the kidney, but is not necessarily an indication of disease, since it may occur when the patient has been taking insufficient water or when there has been

excessive loss of water through perspiration. Absorption and elimination of edema at the time of the test, leading to fixation of specific gravity at a low level, may also confuse the results."*

KIDNEY FUNCTION TESTS

Renal or kidney function is measured by the elimination of fluids, salt and nitrogen. There are many tests which, combined, build for the physician a clear picture as to the health of the kidneys. Thomas Addis** showed that the activity of 50% of the kidneys is sufficient to remove the nitrogenous wastes at the normal rate. It follows that the non-protein nitrogen of the blood will not be elevated until the disease has destroyed at least one-half of the kidneys.***

To attain a proper basis for determination of the functional ability of the kidneys to eliminate wastes, it is necessary that these organs should be working at their maximal capacity.

The function of the kidneys is to excrete solids in solution; that is, to make urine. The solids excreted are the products of metabolism. It is important to measure the amount of urine secreted in a 24-hour period, so that it can be estimated whether the kidney is excreting too much or too little. It is also necessary to keep an exact record of the fluids the patient has taken in during that 24-hour period.

The method used is as follows:

1. Keep a record of all fluids taken during 24 hours.
2. Measure all urine excreted during 24 hours. The difference between these two figures will determine how close you are to normal.

THE P. S. P. TEST

The next test of importance is commonly known as the P. S. P. Test. It makes use of a dye called Phenolsulfonphthalein. After the administration of the dye the patient excretes urine at stipulated intervals. The doctor is able to determine the func-

* J. C. Todd: Clinical Diagnosis by Laboratory Methods, 5th edition. Page 110, W. B. Saunders, Philadelphia, 1923.

** Addis, Thomas: Renal Function and the Amount of Functioning Tissue *Arch. Int. Med.* 30: 378 (Sept.) 1922.

*** The Specific Gravity of the Urine as a Test for Kidney Function. *J.A.M.A.* v. 94: 24, p. 1883, 1930.

tional condition of the kidneys by the rate at which the dye is excreted.

Specific gravities should be taken by the physician and interpreted.

THE MOSENTHAL TEST*

This test takes 24 hours to complete.

During the test, eat solid foods only. Do not drink any additional liquids as coffee, tea, milk, water, fruit juices and do not eat any watery foods such as soup, jello, ice cream, oranges, grapefruit. Do not save any urine voided before 8 a.m. At 8:00 a.m. sharp, drink one quart of water. Do not drink any more liquid at any time until the test is completed at 8:00 a.m. the following morning. Collect urine specimens as follows and do not urinate between times if possible.

Save all urine passed at each of the following specified times: 10:00 a.m., 12:00 noon, 2:00 p.m., 4:00 p.m., 6:00 p.m., 8:00 p.m. Put in separate containers labeled as to time. Be sure to keep each specimen separate.

THE TEST FOR SUGAR IN THE URINE

There is a urine test for sugar, and there is a test for blood sugar. Sometimes the urine will be free of any trace of sugar, and yet the patient will have diabetes with a high blood sugar.

The test for sugar in the urine is useful especially for the diabetic. Most diabetics test their own urine daily. For this purpose a testing kit may be purchased. The simplest one I know of is the "Selftester"** which provides a rapid test for urine-sugar analysis:

1. Place 5 drops of urine in the test tube; rinse dropper and add 10 drops of water.

2. Add 1 reagent tablet, watch reaction, then wait 15 seconds after boiling stops.

3. Shake test tube gently and compare with color chart.

* Mosenthal, a great physiologist and physician, did much of the original research on human urine. The original test is known as the Mosenthal Test in his honor. There are several modifications, one of which is the Fishberg Concentration Test, simpler than the Mosenthal.

** Selftester Sets, Ames Co., Inc., Elkhard, Indiana

THE TEST FOR ALBUMIN IN THE URINE

Albumin in the urine is often found during pregnancy. Normal urine should have no albumin in it. To test for albumin, four or five c.c.'s are heated over a flame and brought to a boiling point. If albumin is present, the specimen will be cloudy. To rule out cloudiness which might be due to precipitation of other substances, two or three drops of ascetic acid are added and the specimen reheated. If the cloudiness remains, then the specimen contains albumin.

The purpose of a 24-hour urine collection can now be appreciated. It tells the physician whether you should start on a diet, continue on it, whether it should be followed more or less rigidly, or discontinued altogether.

THE TEST FOR SALT IN THE URINE

For all patients on a salt-poor, fat-poor diet, whether Karrell's, Schemm's, Kempner's or any other modification thereof, the patient should be taught to run his own salt tests.

Recently a very satisfactory test was developed at the University of Michigan.

A low-salt diet* is satisfactorily regulated with a simple home test of sodium chloride excretion. The technic of Fantus is modified for hypertensive and cardiac cases by J. Marion Bryant and co-workers of the University of Michigan. Once daily a 10-drop sample of urine is shaken in a 5-cc. Kahn test tube with a drop of 10% potassium chromate solution. Silver nitrate in 0.73% solution is then added, drop by drop, until the mixture turns light brown or brick red. With fluid intake of 1 to 3 liters daily and sodium intake of 200 mg., or not over 1.5 gm. of sodium chloride, the end point is reached with 1 to 6 drops.

Blood Tests and What They Reveal

From a relatively small amount of blood taken from a vein in the arm many things may be tested for; they will reveal a great deal of information as to the exact status of your health. In a complete examination of the blood the following may be determined:

1. A Wasserman test to determine whether or not you have syphilis.

* *J.A.M.A.*, 140: 670-672, 1949.

2. A test for blood sugar to determine whether you have diabetes. The normal sugar content of the blood is accepted as 100 mgm. per every 100 cc. of blood; 80 to 120 mgm. of sugar per 100 cc. are the lower and upper normal limits.

I. ONE-DOSE THREE-HOUR TEST (JANNEY AND ISAACSON)

The patient eats freely of carbohydrates (at least 300 gm. daily) for three days before the test and reports in a fasting state the morning of the test. After the bladder is emptied and a sample of blood is taken for sugar determination, the patient is given orally 100 gm. of glucose in 300 cc. of water flavored with lemon juice. Specimens of blood and urine for sugar determinations are secured one-half hour later, and also at the end of one, two and three hours.

In diabetes, the fasting blood sugar may be normal or slightly high; the blood sugar after glucose feeding rises to 180 mg.% or higher during the test and does not return to normal within the three-hour period. Sugar usually occurs in at least two or three of the specimens of urine voided when the blood sugar is above 160 mg.%.

II. ONE-HOUR TWO-DOSE TEST (EXTON AND ROSE)

The patient, after three days on at least 100 gm. of carbohydrates daily, reports in a fasting state for the test. The bladder is emptied and blood is taken for sugar determination. He is then given orally *one-half* of a prepared glucose solution (100 gm. glucose in 650 cc. lemon-juice-flavored water). After 30 minutes a blood sample is again taken, the urine is collected, and the second half of the glucose solution is administered. After 30 more minutes, specimens of blood and urine are once again obtained.

In diabetes, the preliminary blood sugar level may be normal or in excess of 120 mg.%; the level after glucose feeding rises in the first half hour and continues to rise by more than 25 mg. during the second half hour, attaining 160 mg.% or more at the end of the hour.

III. NON-PROTEIN NITROGEN TEST

The blood has a dual function: (1) to carry food and oxygen to the tissues; (2) to carry waste products away from the tissues

to be eliminated through the kidneys and lungs. The group of non-protein nitrogenous waste are substances called urea, uric acid, and creatinin respectively. In health the total amount present should not exceed 20 to 35 mg. in each 100 cc of blood. Over this is abnormal and their presence is dangerous to health. The normal ranges are as follows:

Total non-protein nitrogen	20	to	35	mg.	per	100 cc
urea nitrogen	12	to	18	mg.	per	100 cc
uric acid	1	to	4	mg.	per	100 cc
creatinin	1	to	2	mg.	per	100 cc

IV. CHOLESTEROL IN THE BLOOD

Cholesterol is a fatlike, pearly substance, a monatomical alcohol, crystallizing in the form of acicular crystals. It is found in all animal fats and oils, in bile, blood, brain tissue, milk, yolk of egg, the medullated sheaths of nerve fibers, the liver, kidneys, and suprarenal bodies. It constitutes a large part of the most frequently occurring type of gallstones and occurs in atheroma of the arteries, in various cysts, and in carcinomatous tissue.*

Cholesterol is one of the commonest of the sterol fats. The range for normal is 180 to 250 mg. of cholesterol per 100 cc. of blood. Its measurement in the blood has been used in following the rice diet. The actual role of cholesterol is not known. It is a difficult test to run and the results obtained by an expert chemist may vary 20% on a single blood sample. When an increased amount of cholesterol occurs we usually find a condition of athersclerosis or hyperthyroidism.

In estimating the cholesterol content of the blood, it should not be forgotten that hypercholesteremia need not necessarily be present throughout the entire day. It has been shown, experimentally, that it may be present for a short time after eating, and may be absent for the balance of the day. The time, therefore, to determine the cholesterol content of the blood is within one hour after eating a regular meal.

V. EYE GROUNDS TEST

Examination of the eye grounds bears out the famous saying that "the eyes are the mirrors of the soul."

* *Dorland's Medical Dictionary*. 20th edition, 1944, W. B. Saunders Co., Philadelphia.

The blood vessels seen in the eye grounds, with the aid of an opthalmoscope, are very tiny, much smaller than those first seen in the web of a frog's foot by Malpighi. High blood pressure causes hemorrhages from these small vessels which may be readily seen, in the very early stages of the disease. The condition of these vessels as viewed by the physician reveals exactly their condition of health and so gives a good picture of the rest of the blood vessels in the body. Hardening of the arteries, hereditary diseases, kidney diseases and many other diseases may be diagnosed by an expert in opthalmology.

VI. ADDITIONAL BLOOD TESTS

The blood tells many other stories, with an exactitude which other methods of diagnosis could never reach.

Are you anemic? Do you have too low a hemoglobin (anemia) or maybe pernicious anemia? Too high a red blood cell count? Maybe you have too few red cells and your white blood cells predominate. If so, you may be suffering from leukemia. Is it the acute or chronic type and can it be corrected? Or are you normal? What percent of safety have you? Exact blood counts of red and white cells can be determined as well as abnormal and normal types of blood cells.

Other Tests

If (in the Basal Metabolism Test) it was established that you consume more oxygen than normal you may have a thyroid gland condition, hyperthyroidism, an active goitre which needs immediate medical, surgical, or x-ray treatment. On the other hand, if you have consumed relatively little oxygen, you may be a hypothyroid, (not producing enough thyroid hormone) or a glandular case. This your physician can always correct if discovered in time.

X-rays help in diagnosis of glandular pathology. For instance, a lateral picture taken of the skull will reveal the presence of a pituitary tumor. Diseased pituitary glands cause abnormal weight distribution: abnormal growth (gigantism), water metabolism and many other conditions. Anterior and posterior x-rays of the skull aid materially in making a diagnosis.

If a gallstone is found, or its presence suspected after taking

a flat abdominal plate, then a gall bladder series should be done. A dye is given the patient which is excreted from the body via the gall bladder into the duodenum. The rate of secretion determines whether the gall bladder is diseased or not; non-opaque gallstones can be detected by displacement of the dye in the gall bladder. The dye also definitely locates non-opaque stone.

A flat plate of the abdomen (after taking an enema so that the contents of the bowels do not obscure the picture) gives much additional information to the doctor. He may find kidney stones, gall bladder stones, stones in the ureter, or stones in the bladder. Enlarged kidneys and livers show a definite shadow.

An x-ray of the chest will pick up tuberculosis, cancer, other lung conditions such as bronchitis, irritations from stone dust, coal dust, as well as lung abcesses and many others. The heart will be outlined so that a definite idea as to size and general condition may be ascertained.

Another important test, to determine how the heart is functioning, is the electrocardiogram, commonly known as the E.C.G. From the findings of this test the physician can even venture a prognosis in heart disease.

The heart is the hardest working organ in the human body, resting only in the short interval between heartbeats. If any branch of the heart's coronary artery is blocked (occluded) a condition has developed which is known as an infarction. A loss of blood supply to any heart muscle will cause a condition of ischemia in the area of the occluded vessel.*

When a cardiac accident occurs, if the victim is fortunate enough to have it occur over a period of approximately thirty minutes, thereby allowing the collateral (anastomatic) circulation to dilate, death does not occur. With compensation re-established, the heart beat continues. During this period body rest is necessary, so as not to place any extra strain on the heart.

Gilbert, Fenn and Naleski state: "The coronary flow is a direct function of the mean blood pressure, and a fall of blood pressure will reduce the coronary flow and consequently the amount of blood flowing into the anastomosing vessels. Finally, and of constant importance, any agent that would tend to dilate

* Harris, A. S. and Kokernot, R. H.: Late Development of Ectopic Ventricular Activity Following Coronary Occlusion, Federation Proceedings, 8: 68, 1949.

the coronary vessels and increase the amount of blood flowing through these vessels would, it can be assumed, increase the amount of blood flowing through the collateral and anastomosing vessels. The conclusion seems inevitable that a prompt increase of the blood supply of the infarcted area would decrease the amount of damage done to the myocardial tissue and facilitate the repair of the damage already done."*

Coronary insufficiency is a disproportion between the nutritional requirements of the myocardium (heart muscle) and the nutritional elements then present in the coronary blood supply.

These are some of the reasons why a person should be examined before undertaking *any diet.* First, settle the question scientificaly whether or not a diet is indicated.

* Gilbert, N. G., Fenn, G. K. and Naleski, L. A.: Role of Vasodilator Drugs in Coronary Occlusion, *J.A.M.A.*, 141: 13, Nov. 26, 1949.

THE STORY OF SALT

Our present diets have resulted from the contributions of many great scientists. Likewise the low salt, the rice diet, and the present theories covering these, are not the work of any one man, but rather a compilation of discoveries resulting from years of arduous research.

It all began in France at the turn of the 20th century, in the year 1901, when a Frenchman named Ambard showed that he was aware that there was an offending chemical in cardiac cases, causing premature death. Ambard believed he was dealing with a chloride rather than a sodium problem. It was a long time before the sodium ion, rather than the chlorine ion, was suspected of being one of the chief offenders in aggravating hypertensive cardio-renal vascular disease.

Salt is well-known to be one of the chief kidney irritants. Americans, as a group, like their food highly seasoned, the two most popular condiments being pepper and salt. The total amount of pepper for American consumption alone is 30 to 40 million pounds a year,* an average of 7.1 ounces for each family. This does not include paprika, which is a variety of black pepper.

The use of salt far exceeds that of pepper, and we find that for commercial purposes alone in the United States in 1948 16,403,293 tons were used. On an average, this gives each person in the United States a consumption of six pounds of table salt per year. Excessive use of salt has become universal now, especially in the United States, which uses more salt per capita than any country in the world, and has the highest rate of hypertensives.

Salt is necessary to maintain life, which has given it its great importance. For centuries, from the time of the aborigines down

* Stuart, E. J.: *Nat. Geographic Mag.*, xcv 3, p. 406, Mar. 1949.

through the ages, it has been a means of barter. Life often depended on salt then as it does today.

In 1584, Jean de Marconville in Paris wrote, "The sacredness and dignity of salt! This mineral is like unto the four elements—earth, air, fire and water. So universal, so necessary to life, it is the fifth element."

The Bible contains 32 references to salt. Shakespeare mentions salt in his works no less than 37 times. Salt has been used as coin in Abyssinia, as pay to the Roman legionnaries or warriors, and today it remains the chief medium of exchange in the South Sea Islands. One teaspoon of salt will barter for a peck of potatoes and half a pound will bring two pigs.

We all know that our tears and perspiration are solutions of salt. How many of use realize that we could not live 48 hours without salt; that salt is always in our blood regulating our very lives? It is not only in our blood but in our history.

Here in America in the early 19th century, when the colonists first began turning their thoughts to the Alleghanies, the buffalo and Indians had already established well-beaten pathways to the salt "licks" nestled in the mountains. The salt "licks" were large meadows where the salt water bubbled up from subterranean springs. The Indians had long ago learned to evaporate these waters in huge kettles and obtain salt.

Salt has played a great part in medicine. In the area of the Great Lakes, far from the sea, Wisconsin, Minnesota and Michigan are in the American goitre belt, as is Switzerland in Europe. There is a marked depletion of iodine in the earth in this territory so that iodine is not available for the plants and animals. As a result the people eating these foods do not get enough iodine and develop goitres. In the 1920s, a number of salt manufacturing companies added enough iodine to their product to overcome this iodine deficiency, and made it available to the public as iodized salt. Since that time this state-wide medication has proved its value beyond words.

But today we are concerned with hundreds of thousands of victims of cardio-vascular disease who may prolong their lives by reducing their salt intake to a minimum. There are several well-known diets which have been followed by countless patients

in an attempt to stave off the fatal effects of hypertensive vascular disease (high blood pressure, heart disease, and disease of the blood vessels). Fat-poor, protein-poor and salt-poor diets were developed. As in all fields of research, half truths are usually discovered first. These diets did not solve the problem because the death toll from this disease continued to mount until now it is well over half a million each year and steadily increasing.

Digitalis, the mercurials, and many new drugs recently discovered have helped prolong life, but only for a comparatively short time. For years it has been an accepted theory that kidney tissue or damaged heart tissue never repaired itself. This is no longer true. Back in 1930, it was shown experimentally by Dr. Goldblatt that blood pressure was intimately related to the kidney function. Many researchers have since substantiated his findings. It is now a well-known fact that fifty percent of all diseases of the vascular system come from hypertension. Perhaps one day we will know enough to control the salt balance by the secretions resulting from the pituitary-adrenal function.

Experimentally, the effect of salt on the kidney was shown by Selye and Stone in 1946.* These two research workers fed a series of normal rats exclusively on one food. One group ate nothing but skeletal muscle, another cardiac (heart) muscle, another "purina fox chow," another peas, one lentils, another corn, still another lima beans, and the last group, rice. Before the experiment, all the rats received a 1% salt solution to drink. One kidney was removed in each rat and all were given a pituitary gland product. This produced an artificial kidney condition caller nephrosclerosis (hardening of the kidney blood vessels).

The rats were then put on a high protein diet—corn, etc.; it was found and shown conclusively that the rats which showed the least kidney disease were those on the rice diet.

Regarding the use of salt in our modern diet, let us bear in mind the admonition given us by Dr. Frederick M. Allen in the words with which he concludes his latest paper:

" . . . there is widespread abuse of salt for preservation and for satisfying artificially perverted tastes. While there should

* Selye, H. and Stone, H.: Effect of the diet upon the renotropic, nephrosclerotic, cardiotropic and adrenotropic actions of crude anterior pituitary preparations. Federation Proceedings. 5: 93, 1946.

be special care in salt restriction in families with inherited hypertensive tendencies, education against the prevalent abuse is the preeminent public health requirement for reducing the incidence of hypertension, which is now among the principal causes of death in the civilized world."*

The Research Story, at the conclusion of this volume, is proof, if proof were needed, of how involved is this problem.

* Allen, Frederick M., *Nutrition Views* vii: 9, Sept. 1949.

NATURAL SALT IN FOODS

Every food has salt in it. The best salt free diets worked out by the medical profession contain some salt. For this reason it is so necessary for the patient to keep to the diet prescribed and not to add any more salt to his menu.

Here is as good a place as any, to take up the question of "salt substitutes." There are no safe salt substitutes for salt. There are many kinds of salts in nature. Chlorine can combine with many elements beside sodium—but many are poisonous, especially to the patient on a low sodium diet. One of the more recent compounds used as a salt substitute was lithium chloride. Those who used it without fatal consequences became seriously ill. Waldron* reported two cases of lithium poisoning in 1949.

Two cases of poisoning were reported** Feb. 15, 1950 in Kings County Hospital, New York, in spite of the warning by the medical profession and the newspapers. The salt substitute used in these two cases was called Westsal—a lithium chloride.

Page*** and co-workers, and Hanlon**** and his co-workers have published protocols indicating the noxious effects of lithium chloride when used in conjunction with a low sodium diet. The former observers are of the opinion that patients on low salt diets exhibit an increased susceptibility to the toxic effects of lithium.

Potassium is another element usually found present in food in conjunction with sodium. In the chemical estimations of sodium content, potassium traces tend to be weighed with the sodium so that a small appreciable error is introduced, which may be

* Waldron, A. M.: *Univ. Bull.*, 15: 9, 1949, Ann Arbor, Michigan.

** Greenfield, I. Zuger M., Bleak R. and Bokal, S.: Lithium Chloride Intoxication, *N. Y. S. J. Med.*, pp. 459-460, Feb. 15, 1950.

*** Concoran, A. C., Taylor, R. D., and Page, I. H.: *J.A.M.A*, 139: 695, 1948.

**** Hanlon, L. W., Romaine, M., Gilbroy, F., and Deitrick, J. E.: *Ibid.*, 139: 1949.

relatively larger as the quantity of sodium approaches zero. The figures are obtained today by use of flame photometry and represent a new order of accuracy in figures for sodium content.

The sodium (Na) content, the magnesium (Mg) and potassium (K) contents of foods are given in the lists on pages 202 to 206.

It should be remembered that although our foods may be low in salt, they must be cooked, and that in the cooking, salt is added, because of the salt in the water. We know that the average person drinks or imbibes from his cooked foods, about two liters of water. If the water normally contains 20 milligrams (mg.) of sodium per 100 cc, then he will, during the course of a day, receive 400 mg. of sodium from the water alone. This alone is about 40 times the amount that he should be receiving for the whole day. This shows how important is the daily fluid intake, on his salt-free diet. It may mean the margin of safety for the dieter between life and death itself. Therefore the salt in your water supply must be estimated correctly so that your doctor can figure out the exact amount in your daily intake.*

The Salt Content Table, published by Mead Johnson and Company, shows the great variation in salt content. It is to be remembered that when salt is taken into consideration, it is not only the ordinary sodium salt (table salt), but that potassium and magnesium are considered members of the salt family, and contribute their detrimental share, in our salt intake, to the kidney function.

Drinking Water

Common table salt is a combination of two elements, sodium and chlorine. Separately, each of these elements is a deadly poison. Chlorine is a yellow, irritating gas used in the manufacture of poison gas. Sodium is a waxy soft metal with caustic properties. When a molecule of sodium combines with a molecule of chlorine we have common table salt. The salt concentration in the blood stream is of primary concern to all sufferers of cardio-renal vascuar disease. The salt intake of these patients

* The total amount of salt intake per day is discussed in later chapters.

must be held down to a minimum. It is only then that they can lead useful and comfortable lives.

Drinking water for patients on low salt diets is quite a consideration, especially in some localities. The water supply in some sections of the country is higher in mineral content than in other sections. The water supply may be soft or hard water, depending upon the calcium content of the water Because the water is spring water does not mean it is pure, free of mineral content. We have sulphur springs, lithia springs, salt springs, etc. The mineral content of water varies with the district through which the water has passed underground and with the mineral layers through which it has filtered.

Large cities have greater problems with their water supplies. I am including Dr. Seymour Coles' paper as it brings out many considerations of primary importance to the "Low Sodium" dieters.

"The water supply to any one large city usually comes from several sources. In Los Angeles for example, three rivers supply her water: (1) The Los Angeles River with a sodium content of 55 parts per million, (2) the Owen's River and Valley Aqueduct with a sodium content of 47 p.p.m., (3) the Colorado River (Metropolitan Water District) with a sodium content of 194 p.p.m.

"The sodium content of the water may be further increased by the softening processes in the various institutions in which it is used. Also, the sodium content of the hot water tap is higher than of the cold tap. This is a factor to be considered when water is heated for any purpose in the preparation of food for patients with hypertension, renal disease and heart disease.

Effect on Low Salt Diets

"The table shows the effect of the use of water with a sodium content of 25 mg. on representative low salt diets. It gives the ranges of daily sodium and fluid intakes permitted by the various authors.

THE EFFECT OF THE USE OF TAP WATER WITH A SODIUM CONTENT OF 25 MG. PER HUNDRED CUBIC CENTIMETERS IN THE LOW SALT DIETS OF SCHROEDER, SCHEMM AND KEMPNER.

	Diet: Sodium, Gm.	——Fluid, Cc.——		—Sodium from Fluid, Gm.—		
		Intake	Hidden	Intake	Hidden	Total
Schroeder (1a)	0.500 to 1.000	3,000	300	0.750	0.075	0.825
Schemm (1c)						
Initial	0.850	3,000	780	0.750	0.175	0.925
Neutral	0.850	5,000 to 10,000	780	1.250 to 2.500	0.175	1.425 to 2.675
Kempner (rice 1d)	0.200	1,000	600	0.250	0.150	0.400

"The water used in cooking rice and other vegetables and foods is estimated and represented by the figures for hidden fluid.

"The last column shows the sum total of the sodium derived from drinking and hidden water. In Schroeder's diet, it exceeds the minimum and approaches the maximum sodium permitted. In the Schemm and Kempner diets, the sodium from fluid sources is greater than the total sodium allowed for the entire diet."

Summary

Cole's paper* emphasizes the importance of studying the sodium content of tap water in the establishment of a low salt diet in the treatment of high blood pressure, heart disease and renal disease.

The tap water of an institution is described and the factors contributing to its high sodium content are discussed. The effect of the use of such water on representative low salt diets is illustrated.

It is suggested that substitution of distilled, deionized or spring water of low sodium content for tap water of high sodium content is a necessary precaution to insure the success of a low salt diet.

Kempner has hurdled the drinking water problem by having the patients on the rice diet drink fresh fruit juices instead of water.

* Seymour L. Cole, Los Angeles County Hospital, "Tap Water Sodium in the Low Salt Diet," *J.A.M.A.* 140: 1, 19-20, May 7, 1949, from the Metropolitan Water District of Southern California, report for the Fiscal Year, July 1, 1945 to June 30, 1946.

Most large cities have available the salt content of their water supply. This may be obtained from the city or state department of the particular city or locality. By sending in a sample of well water to your state department you can get a complete analysis of your local water.

The Research Laboratory of Mead Johnson and Company at Evansville, Indiana, is rendering a great public service by publishing a booklet called "Sodium and Potassium Analysis of Foods and Waters"—data for the use of physicians, dietitians and research workers interested in low sodium diets.

The following is their list of various city water supplies and their salt water content.

SALT CONTENT IN WATER SUPPLIES

	Na per 100 Cc.	K per 100 Cc.
Aberdeen, S. D.	20	2.
Albany, N. Y.	0.2	0.2
Albuquerque, N. M.	5	0.7
Annapolis, Md.	0.2	0.2
Ann Arbor, Mich.	2	0.5
Atlanta, Ga.	0.2	0.2
Augusta, Maine	0.2	0.2
Austin, Texas	3	0.5
Baltimore, Md.	0.3	0.2
Bangor, Maine	0.2	0.1
Baton Rouge, La.	9	0.2
Beloit, Wis.	0.5	0.2
Biloxi, Miss.	23	0.6
Birmingham, Ala.	2	0.3
Bismarck, N. D.	6	0.6
Boise, Idaho	2	0.3
Boston, Mass.	0.3	0.2
Brownsville, Texas	6	0.3
Buffalo, N. Y.	0.7	0.3
Burlington, Vt.	0.2	0.1
Carson City, Nev.	0.4	0.3

	Na per 100 Cc.	K per 100 Cc.
Charleston, S. C.	1	0.3
Charleston, W. Va.	0.3	0.2
Charlotte, N. C.	0.3	0.1
Charlottesville, Va.	0.2	0.1
Cheyenne, Wyo.	0.3	0.2
Chicago, Ill.	0.3	0.1
Cincinnati, Ohio	0.7	0.3
Cleveland, Ohio	1	0.3
Columbia, S. C.	0.4	0.2
Columbus, Ohio	5	0.6
Concord, N. H.	0.2	0.1
Crandall, Texas	170†	0.5
Dallas, Texas	3	0.5
Denver, Colo.	3	0.2
Des Moines, Iowa	1	0.4
Detroit, Mich.	0.3	0.1
Dover, Del.	2	0.5
Durham, N. C.	0.4	0.2
El Paso, Texas	7	0.6
Ephrata, Pa.	0.3	0.2
Evansville, Ind.	2	0.5
Fargo, N. D.	5	0.7
Frankfort, Ky.	0.3	0.1
Galesburg, Ill.	30	2
Galveston, Texas	34	0.7
Harrisburg, Pa.	0.2	0.1
Hartford, Conn.	0.2	0.1
Helena, Mont.	0.3	0.2
Houston, Texas	16	0.6
Huntington, W. Va.	3	0.2
Indianapolis, Ind.	1	0.3
Lowa City, Iowa	0.5	0.3
Jackson, Miss.	0.4	0.2
Jacksonville, Fla.	1	0.2

† An extreme example. This water is rarely drunk, but is used for cooking.

	Na per 100 Cc.	K per 100 Cc.
Jefferson City, Mo.	3	0.4
Jersey City, N. J.	0.3	0.2
Kansas City, Kan.	4	0.4
Kansas City, Mo.	10	3
Lansing, Mich.	1	0.5
Lincoln, Neb.	3	0.7
Little Rock, Ark.	0.1	0.1
Los Angeles, Calif.:		
Aqueduct source	6	0.6
Metropolitan source	17	0.6
River source	5	0.5
Louisville, Ky.	2	0.3
Madison, Wis.	0.4	0.2
Manchester, N. H.	0.2	0.1
Marion, Ohio	17	0.7
Memphis, Tenn.	2	0.3
Miami, Fla.	2	0.3
Milwaukee, Wis.	0.3	0.1
Minneapolis, Minn.	0.5	0.3
Minot, N. D.	25	0.6
Montgomery, Ala.	0.8	0.1
Montpelier, Vt.	0.1	0.1
Nashville, Tenn.	0.3	0.2
Nevada, Mo.	33	0.7
Newark, N. J.	0.2	0.1
New Haven, Conn.	0.3	0.1
New Orleans, La.	1	0.4
New York, N. Y.	0.3	0.2
Oakland, Calif.	0.3	0.1
Oklahoma City, Okla.	10	0.8
Olympia, Wash.	0.5	0.3
Omaha, Nebr.	8	1
Philadelphia, Pa.	2	0.4
Phoenix, Ariz.	11	0.7
Pierre, S. D.	9	0.5
Pittsburgh, Pa.	6	0.5
Portland, Maine	0.2	0.1

	Na per 100 Cc.	K per 100 Cc
Portland, Ore.	0.1	0.1
Providence, R. I.	0.2	0.1
Raleigh, N. C.	0.4	0.1
Reno, Nev.	0.5	0.1
Richmond, Va.	0.7	0.2
Rochester, Minn.	0.7	0.2
Rochester, N. Y.	0.3	0.2
Sacramento, Calif.	0.3	0.2
Santa Fe, N. M.	0.4	0.1
St. Louis, Mo.	5	0.5
St. Paul, Minn.	0.5	0.3
Salem, Ore.	0.2	0.1
Salt Lake City, Utah	0.8	0.2
San Diego, Calif.	5	0.5
San Francisco, Calif.	1	0.3
Seattle, Wash.	0.2	0.1
Sioux Falls, S. D.	1	0.4
Springfield, Ill.	0.8	0.3
Syracuse, N. Y.	0.2	0.1
Tallahassee, Fla.	0.3	0.1
Topeka, Kan.	1	0.5
Trenton, N. J.	0.1	0.1
Tuscon, Ariz.	3	0.3
Washington, D. C.	0.3	0.3
Wichita, Kan.	5	0.5
Wilmington, Del.	0.8	0.1

SUGAR

Sugar is the most important source of energy in the rice diet. There are many sugars, derived from many sources. The most important sugars, from the standpoint of food value, are the Disaccharides and the Monosaccharides. The former have 12 carbon atoms in their chemical structure, and the latter have six carbon atoms. The common disaccharides are sucrose (beet or cane sugar), lactose (milk sugar), and maltose (malt sugar). There are only two monosaccharides—glucose (dextrose) and levulose (fructose).

Commercial sucrose is 99.85% pure carbohydrate; the other forms of sugar contain certain other constituents in varying amounts. Sugars vary in their relative sweetness.

Taking sucrose as the yardstick, the values follow:

RELATIVE SWEETNESS OF THE VARIOUS SUGARS

Kind of Sugar	*Approximate Sweetness**
Sucrose	100.0%
Glucose	74.0%
Lactose	16.0%
Levulose	173.0%
Maltose	32.5%

GLUCOSE (*dextroglucose or dextrose or grape sugar*)**

True glucose, a monosaccharid, is a simple or single sugar, widely distributed in the vegetable and animal kingdoms. It is found in large proportions in some fruits and some vegetables. The sweet granular deposit on raisins is an interesting example of natural glucose. From the oxidation of glucose in our tissues, we derive fully half (or more) of the energy we need for our daily living. Our bodies may obtain glucose from the direct con-

* Willaman, Wahlin and Biester: *The Relative Sweetness of Invert Sugar*. Amer. Jour. Physiology: 73, 397-400, 1925.

** Ward, Artemus: Encyclopedia of Food. Peter Smith, Publisher, N. Y. 1941.

sumption of those foods which contain it, but our main source of supply is from the conversion of carbohydrates into glucose in the liver.

Under normal conditions, the glucose passes unchanged into our body tissues—there to be split up and oxidized, to produce energy. Any surplus is temporarily converted into glycogen and, as such, is stored in the liver and elsewhere. If there is a considerable surplus, it is converted into fat.

"Commercial glucose" is poorly named, for its glucose content is less than that of molasses. It is better described as a syrup. The chief source in the United States is almost exclusively Indian corn or maize.

"Commercial dextrose" (dextrose being, as noted in the caption above, an alternative for glucose) has a better claim to its name. In the United States, both its origin and character are better known by the term corn-sugar, and it is therefore so listed.

Levulose (*levoglucose or fructose or fruit-sugar*)

Levulose, also a monosaccharid, is a simple or single sugar found in fruits, vegetables and honey. Unlike glucose, it is found only to a very small extent (if at all) in animal blood. When consumed in foods or formed in the intestines it passes chiefly into the liver in the form of glycogen, to be converted later into glucose, and as such, to enter the tissues of the body.

Levulose is almost uncrystallizable, and to this characteristic is due the honey-like consistency of invert sugar.

Lactose (*milk sugar*)

Lactose is obtained from the whey of milk, obtained chiefly from cheese factories. The whey is digested with aluminum hydroxide and chalk, and then filtered. The liquid obtained is concentrated to a syrup, and placed in copper-lined tubs to crystallize; chips of wood are added and immersed in it. The crystals deposited on the chips are finer in quality; those formed on the sides of the vessel are of secondary commercial importance.

Lactose, as noted in the table above, is not as sweet as glucose or sucrose. It is used largely in the preparation of homeopathic remedies and in food for infants.

Below, we are listing the various names under which sugars appear on the market:*

Sugars

The term sugar, used without any qualification, refers to refined sucrose in the granulated form, made either from sugar cane or beet sugar. Market grades of cane and beet sugar are based on the degree of refinement and the size of the crystals. When the kind of sugar is not specified, it means granulated sugar.

I. *White sugar* is graded according to the size of the particles:

(a) Granulated sugar

(1) Standard granulated sugar consists of the medium-sized crystals most commonly used in cookery.

(2) Berry or fruit sugar (sometimes known as fruit powdered sugar) consists of small crystals, used mostly when rapidity of solution is desired, as in iced beverages or on raw fruits.

(b) Powdered sugar is prepared by grinding coarse granulated sugar. Two grades, according to size of particles, are commonly found on the retail market.

(1) Powdered sugar (XX), consisting of the coarser particles and

(2) Confectioners' sugar (XXXX), consisting of finer particles, is used chiefly in meringues and uncooked icings.

II. *Brown sugar* is an intermediary product powdered in the refining of cane sugar from raw sugar. Ricers must not use brown sugar.

III. *Other sugars*

Maple sugar consists of the crystallized solids of maple syrup.

For the Ricer, maple sugar is a natural sweet or candy; it is

* *Terminology used in Food Preparation.* American Home Economics Assn.

nutritious and does much to relieve the monotony of the diet. The danger to the Ricer is due to the method sometimes used in the manufacture of the maple sugar. As the woodsman boils the sap to drive off the excess water, it has a tendency to splatter. To prevent this, and also to reduce the boiling time, he may add a quantity of bacon fat. The fatty esters and the cholesterols are, of course, forbidden to the Ricer. It is, therefore, essential for the Ricer to purchase maple syrup and maple sugar from a known source, from someone who is willing to evaporate the sap slowly, without any additions or adulterants.

Corn sugar is crystallized dextrose, obtained by the hydrolysis of the starch in corn.

Different forms of syrups are:

Molasses is the residue left after the extraction of the crystalline sugar. The second and third grades are obtained through the second and third extractions.

Corn syrup or commercial glucose is prepared by hydrolizing cornstarch with hydrochloric acid. Corn syrup is forbidden to Ricers.

"*Honey* is a natural, unrefined, nutritionally valuable food. It is unique in that it is the only unmanufactured sweet available in commercial quantities.

"Seventy-five per cent of its composition is sugars which give honey an energy-producing value second to few foods. Commonly used sugars, cane and beet, must be broken down into simpler sugars by digestive juices before they can be assimilated into the blood stream and tissues. These resulting simple sugars, dextrose and levulose, make up almost the entire sugar content of honey. This makes it reasonable to conclude that little digestion is necessary and absorption takes place quickly. It is also reasonable to conclude that, except in unusual cases, the utilization of honey puts no tax upon the digestive system."*

In addition, honey contains several elements known as trace-elements (present in infinitesimal amounts). Their presence is necessary for body metabolism in the electro-chemical interactions between the body cells.

* Schultz, F. W.: Bobs Roberts Memorial Hospital for Children, The University of Chicago.

All honeys have a small salt content, but the light colored honeys have a smaller salt content than the dark colored honeys.

If your physician approves of the substitution of honey for sugar when you are on the Augmented Rice Diet, the honey which should be used is the white honey (belonging to the light honey group) as the white honey has the smallest salt content of any of the honeys, only 15 milligrams of sodium in one kilo of honey.*

* Schuette, H. A. et al: Degree of Pigmentation and the Potential Acid Base Balance of Honey. Wisconsin Academy of Sciences, Arts and Letters, xxxii: 273-277, 1940.

THE STORY OF RICE

Rice* is the most extensively cultivated of grains and the principal food of more than one-third of the entire population of the world. Before fruiting, the plant is a good deal like wheat in its general appearance, but the seedhead, or panicle, is entirely different. It consists of a number of fine stalks, each one bearing a single grain, instead of the compact ear of the wheat-plant. In the most commonly cultivated and productive types, it must be kept flooded during the growing season, and it is, consequently, most easily raised on level lowlands with shallow soil resting on a clay subsoil. Rice can, though, be grown at almost any elevation if irrigation is feasible.

In Japan and the Philippines, satisfactory crops are obtained even on the terraces of hills and mountainsides by periodic flooding from reservoirs above.

"Upland rice," originally cultivated in the South for forage, but now used for human consumption to some extent, does not require flooding at all; it is grown much as is any other grain crop.

The cultivation of rice was started in this country in 1694, when a Captain Smith, arriving from Madagascar, presented a bag of "paddy" or rough rice to a merchant of Charleston, South Carolina. The industry developed steadily, and production in South Carolina and Georgia, during the generation preceding the Civil War, was about a million barrels a year. A new impetus was given shortly after the close of the Civil War, when cultivation spread to Louisiana, Texas and Arkansas, and recently to California. The United States is fast developing into one of the world's greatest rice growing countries.

There is every reason why rice should be an everyday article of diet in American homes. It is nutritious, easily digested, al-

* Ward, Artemus: Encyclopedia of Food. Peter Smith, Publisher, 1941.

most completely assimilated, and last, but not least, very palatable. Uncooked white rice (the outer layers removed) contains an average of nearly 88% nutrients (slightly more than wheat). The components include 8% protein; 79% carbohydrate (chiefly starch), and a very small amount of fat. Whole or brown rice contains 2% fat (a little more than wheat). In countries where rice is the principal article of diet, the remaining necessary protein is supplied largely by fish, soy-beans and cheese.

The initial preparation of rice for the market involves thrashing (which gives paddy or rough rice) and milling, which first removes the husks (yielding white or brown rice), and then (if ordinary white rice is desired) also removes the outside layers of the grain. White rice is next polished by means of rapidly revolving pigskin cylinders. Coated rice is polished white rice thinly coated with a mixture of corn syrup and talc to give it a pearly luster. This coating readily dissolves when the rice is washed.*

There is considerable confusion in the use of the terms polished and unpolished, and coated and uncoated. This is due to the fact, that in the trade, polished signifies coated, and unpolished signifies uncoated. This is incorrect terminology, for polishing and coating are separate processes, as noted in the preceding paragraph. Practically all white rice is polished. If the term unpolished is used, it should be applied to brown rice.

The removal of the outer layers of the rice-seed deprives the rice of part of its nutrients, and all of its vitamins, also of much of its flavor. This is comparatively unimportant if the food supply is otherwise adequate and well-balanced, but it is a matter of serious consideration when the diet is poor and scantily supplied with other sources of vitamins.

A better acquaintance with high-grade brown rice would result in a wider appreciation of it, for it is very tasty indeed. But it requires greater care in storing and handling (it is more subject to the depredations of weevils), and its cooking must be more careful and for twice the usual length of time.

A good quality white rice should be bright and flinty in appearance—not muddy. If of lower grade it may be grayish or

* This coating must be entirely removed for those on the rice diet, and it is the reason why Ricers must have the rice so thoroughly washed before cooking.

slightly rosy. The best, or fancy grade rice should be practically free from damaged and chalky grains, foreign seeds, grit or hulls, and should contain only a small percentage of broken grains. If white rice looks yellowish, it signifies it has been kept overlong.

Brown rice varies from light yellowish to brownish, with a few greenish grains.

The best known rices of American cultivation are the Honduras, Carolina, Blue Rose and Japan, with Honduras ranking the highest. Domestic extra fancy Honduras—a long, slender, sweet grain—is the finest grown and commands top prices in all the world's markets. Carolina is a long, generally thicker-bodied grain. Japan is round-bodied and soft-grained. Blue Rose is of medium length and is classed as short.

The bulk of imported rice is grown in India (especially Burma), French-Indo China (whose rice is known commercially as Saigon rice) and in Siam. The most highly esteemed is the Patna—a long, slender well-rounded, pearl-white grain—grown and partly milled in India and finished in Holland and other European countries, but the quantity imported is inconsiderable. The total import of all types of rice runs into very large figures, but the figure is greatly exceeded by our exports, for American rice now goes nearly all over the world.

Rice should never be stored in a damp place, nor should the bags be placed on a stone floor, as either procedure will cause it to deteriorate in appearance. Rice sold in packages or bags is, for sanitary reasons, preferable to rice sold in bulk.

There are many ways of boiling rice. The first essential in any recipe is to wash it in several waters until the water is clear, or in running water. A good rule (except when using a double boiler) is to add the rice to several quarts of rapidly boiling water, adding the rice slowly, so as not to check the boiling. Then let boil rapidly until soft—about twenty minutes. Next, drain off the hot water and wash several times with cold water. The observance of these simple directions will insure rice that is thoroughly cooked, and yet each grain will be separate.

As brown rice, similarly treated, takes considerably longer to cook than white rice does, it is advisable to soak it in tepid water for about an hour or so before boiling.

Puffed rice is made by putting the grain into sealed cylinders, or "guns," which are then revolved for an hour at a heat of 550° F. The heat converts the grain moisture into steam, and when the gun is suddenly unsealed, the steam contained in each individual grain explodes, pulverizing the starch granule and puffing it to several times its original size.

Rice-macaroni, an Oriental product, is of the same general type as solid spaghetti. It is made in various styles—most commonly in thin, beautifully white, vermicelli-like strands which are unique in being flexible, and which are usually cut into lengths of six to ten inches, and tied in bundles.

Rice-meal consists of the rice bran removed in milling. Because of its high protein and fat content, it is the most nutritious of the rice by-products. It is used chiefly as stock food.

Rice-polish is that part of the grain removed in the polishing of the rice. The bulk of the supply is utilized industrially, but it is a valuable food product of the same class as rice-meal.

The three brands of rice recommended for Ricers are the Carolina, the River and the Comet brands. There are, of course, many other rices, but many types of rice are unsuited for the Ricers.

Rice protein, as far as the metabolism of the kidney cells is concerned, cannot be indiscriminately replaced by another protein. Proteins vary according to the arrangement of the molecules of the amino acids composing the protein. A common example of protein differences is clearly exemplified in allergy patients. A person may be able to eat meat protein, but will become deathly ill after eating a fish protein.

THE RICE DIET

In 1946, Selye and Stone showed that rats fed exclusively on rice suffered less kidney damage than rats fed exclusively on other high protein diets (see page 29).

The rice diet enables the patient to hold his salt content down to a minimum, because fruit juices and fruits have little natural salt content. (See Natural Salt Content of Foods).

Of all the diets, this one gives the body tissues their best opportunity to repair themselves, because of the added rest to the tissues on this type of diet.

The very fact that all the foods permitted on the rice diet are relatively non-irritating to the kidney cells means that a state of relative rest has been created and the kidney has less work to do. It can, therefore, concentrate on its own repair (see The Research Story).

The drastic limitation of fluid intake, *without salt,* reduces the strain on the heart, and it, too, receives more rest.

When you realize that approximately one teaspoonful of salt holds one pint of fluid (water) in the tissues of the body, you more easily appreciate the necessity of being as nearly salt-free as is compatible with life.

Unfortunately, the existing rice diets are so rigid that many patients do not have the will-power to continue them long enough to get the desired results. It is very difficult to keep on a low salt diet of less than 0.5 gm. of sodium daily (or any other rigid diet) without being institutionalized or under constant medical supervision. The patients need constant encouragement and watching. They become depressed and agitated after only one week on the diet. The disease itself tends to emotional instability which is not conducive to furnish the will power to stay on a rigorous salt-restricted regime. These patients must change their environment if it is at all irritating to them emotionally. They need mental peace and security.

We know the rice diet is deficient in sufficient protein to maintain life* over an extended period of time; and that it is dangerous to patients with impaired renal function. However, evidence has been presented that acute or chronic nephritis cases as well as congestive heart failure cases have benefited by a 100 day course on this diet.

Excellent results have been noted in cases of marked edema or those with nitrogen retention after being on the low sodium, low protein diet. When the edema resolves, the burden on the heart is decreased. As a result the heart size decreases and shows improvement by the electrocardiographic tracings and the blood pressure levels.

The rice diet may be drastic but when a patient is in heart failure, drastic measures are needed. If the body will respond to diet alone, it is better than adding an extra burden on the kidney to eliminate additional chemicals through an already over-burdened kidney.

The rice diet with only about 20 gm. of protein, if continued too long, will result in injury to the liver. For this reason, after the initial 100 days, supplementary items of food are added to the original strict diet.

F. Schemm,** who developed the famous Schemm diet, remarked that the psychological value of the rice diet, administered hopefully and with conviction in surroundings especially suited to its enthusiastic reception, cannot be underestimated.

The statement is very true. The rice diet is the only diet which has inspired song among its followers and has developed a spirit of comradeship, one patient with the other, until the chain has encircled the globe. The patients communicate one with the other, give one another encouragement and thus there has developed an *esprit de corps.*

The story of the development of the Rice House is, I think, quite interesting. It started in Durham, North Carolina.

The first Rice House was the private home of Mrs. Mar-

*Schwartz, W. B. and Merlis, J. K.: Nitrogen Balance Studies on the Kempner Rice Diet., *J. Clin. Investigation*, 27: 406, 1948.

** Unpublished report. Panel Discussion, American Heart Assn., Scientific Session, Atlantic City, N. J., June 4, 1949. Management of Congestive Heart Failure and Importance of Low Sodium Diet. Burch, G. E., Dock, W., Kempner, W., Progen, S., Schemm, F., and Warren, J.

garet Robinson. Her husband was one of Dr. Kempner's first patients. It was through her co-operation in testing the practicability of many of the rice menus that the present diet was developed. (The original rice diet consisted of a bowl of rice and a peach. If the patients had not been so desperately ill, they could never have adhered to such a diet for long). When patients started flocking to Durham from all over the country to be under Dr. Kempner's care, the limited facilities at Duke University Hospital soon proved insufficient. This led to the opening of the so-called Rice House, in which not only bed patients could be looked after, but which could serve the rice diet to the ambulatory Ricers, who found residence in the private homes in the neighborhood. This system of feeding patients—from a central kitchen—domiciled in neighborhood homes has now been extended to well over a hundred houses.

The Ricer's Theme Song

*(Yale—Please Excoose)**

The Ricer's Theme Song was inspired by the mournful melody of the Whiffenpoof Song. Mr. Ferdinand Larson, a musician as well as a successful business man, could think of nothing more pathetic than a lost lamb. The analogy to a patient suffering from hypertension and not knowing what to do about it was so great that he re-worded the original Yale song, cleverly bringing in the salient points of the Ricer's problems. The song was first sung by about 100 Ricers at the 1948 New Year's Party held in Durham, North Carolina, in one of the original Rice Houses.

To the tables down at Newtons—
To the place where Barbee dwells
Dear old Mangum Street we all know so well
Here the Ricers all assemble—for their
Breakfast—sharp at eight,
And of most delicious food they then partake.

Yes—the magic of this diet is a tale known far and wide,
And its Proctor Doctor Kempner meets the test
There's Doctors Starkey, Peschel, Murphy, Eadie and the rest—
They will ever be remembered as the best.

We are poor little lambs who ate too much
Baa—baa—baa.
We're little black sheep who suffer as such
Baa—baa—baa.
Ladies and gentlemen—Ricers we—
Doomed to rice for eternity
Lord have mercy on such as we—
Baa—baa—baa.

Parody by Ferdinand Larson, New York.

* Sung to the tune of the Whiffenpoof Song.

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THE BASIC DIET MENUS

THE BASIC DIET

The basic 100 day diet (after Kempner) is the same for breakfast, lunch and dinner; that is, each meal consists of eight ounces of fruit juice; one-third of a pound of rice; three ounces of three different fruits.

The Ricer must take two vitamin pills daily—after lunch and after dinner.

This is of vital importance and the patient should never forget to take his quota of vitamins each day. Your physician will recommend the vitamin he has found most efficacious; some of the standard ones are: Unicap (Upjohn); Vi-Penta Perles (Hoffman-La Roche); Dayamin (Abbott); Theragran (Squibb); Multicebrin (Lilly); Thera-Vita (Warner).

White granulated sugar may be used as the Ricer's taste dictates.

It is preferable to cook the rice fresh for each meal, but if this is not convenient, the day's full quota of rice may be prepared every morning. The rice should be very thoroughly washed, cooked in unsalted water, and divided into three equal portions.

The use of an eight-ounce glass will do away with the necessity of measuring out eight ounces for each meal.

After the Ricer has had a little experience in measuring out three ounces of fruits in the regulation fruit cup, or in the small plastic dishes (obtainable in the 5 & 10c stores), he will be able to dish out the correct portions of fruit without weighing the three ounces each time.

When a patient is told to use three different fruits, three times a day, there is a tendency to too much repetition as the patient seems to find it difficult to think of nine different fruits a day. This tends to make the meals unnecessarily monotonous.

I have therefore drawn up a series of Menus for four weeks —two weeks for cold weather, and two weeks for warm weather.

For the Cold Weather Menus, the Ricer will find one or more hot dishes (in addition to the rice); for instance, the Menu calls for broiled grapefruit instead of cold grapefruit. The Ricer has a greater desire for warm food in cold weather, than would ordinarily be the case, because he is forbidden hot drinks, in the form of tea, coffee or cocoa.

The Hot Weather Menus feature soothing concoctions; these are specially important to the Ricer in hot weather, as his fluid intake is limited to 24 ounces a day, regardless of the loss of water through perspiration.

When consulting the Menus, remember the quantities recommended are as follows:

All fruit juices .....use 8 ounces
Rice .....use 1/3 pound*
All fruits.....use 3 ounces of each

* The amount may be increased or decreased, according to the individual case.

COLD WEATHER MENUS

Monday

BREAKFAST

Orange juice
Rice
½ Grapefruit, broiled
Stewed plums
Fruit cup

LUNCH

Orange juice
Rice
Baked apple
Raspberries
Red cherries

DINNER

Grapefruit juice
Rice
Stewed figs
Banana
Gooseberries

Tuesday

BREAKFAST

Orange juice
Rice
½ Grapefruit, broiled
Applesauce
Peach

LUNCH

Grapefruit juice
Rice
Stewed plums
Banana
Raspberries

DINNER

Orange juice
Rice
Baked apple
Loganberries
Pineapple chunks (Dole)

COLD WEATHER MENUS

Wednesday

BREAKFAST

Orange juice
Rice
½ Grapefruit, broiled
Banana, sliced
Strawberries

LUNCH

Orange juice
Rice
Cooked prunes (Sun Dried)
Loganberries
Apple sauce

DINNER

Orange juice
Rice
Queen Anne cherries
Raspberries
Baked pear

Thursday

BREAKFAST

Orange juice
Rice
½ Grapefruit
Cooked figs
Longanberries

LUNCH

Orange juice
Rice
Fruit cup
Raspberries
Apricots

DINNER

Orange juice
Rice
Plums
Cranberries
Baked banana

COLD WEATHER MENUS

Friday

BREAKFAST

Orange juice
Rice
Cranberry sauce
Prunes (Sun Dried)
Baked apple

LUNCH

Grapefruit juice
Rice
Raspberries
Banana, sliced
Queen Anne cherries

DINNER

Orange juice
Rice
Pineapple chunks
Blueberries
Peach, sliced

Saturday

BREAKFAST

Orange juice
Rice
Banana, sliced
Strawberries
Apple sauce

LUNCH

Prune juice
Rice
Apricots
Raspberries
Pear, sliced

DINNER

Orange juice
Rice
½ Grapefruit, broiled
Plums
Blueberries

COLD WEATHER MENUS

Sunday

BREAKFAST

Orange juice
Rice
Stewed figs
Peach, sliced
Stewed blueberries

LUNCH

Grapefruit juice
Rice
Pineapple chunks (Dole)
Loganberries
Baked apple

DINNER

Orange juice
Rice
Baked banana
Fruit cup
Stewed plums

Monday

BREAKFAST

Orange juice
Rice
Baked apple
Pear, sliced
Stewed apricots

LUNCH

Prune juice
Rice
Fruit cup
Stewed blueberries
Banana, sliced

DINNER

Orange juice
Rice
Stewed plums
Stewed rhubarb
Fruit cup

COLD WEATHER MENUS

Tuesday

BREAKFAST

Orange juice
Rice
Stewed prunes (Sun Dried)
Pineapple slice (Dole)
Stewed rhubarb

LUNCH

Grapefruit juice
Rice
Baked pear
Cranberry sauce
Peach, sliced

DINNER

Orange juice
Rice
Black Bing cherries
Stewed apricots
Baked banana

Wednesday

BREAKFAST

Orange juice
Rice
Queen Anne cherries
Cooked apple slices
Stewed apricots

LUNCH

Prune juice
Rice
Stewed plums
Stewed apricots
Banana, sliced

DINNER

Orange juice
Rice
Raspberries
Stewed rhubarb
Baked apple

COLD WEATHER MENUS

Thursday

BREAKFAST

Orange juice
Rice
Apricots (canned or frozen)
Raspberries
Banana, sliced

LUNCH

Grapefruit juice
Rice
Stewed prunes
Blueberries
Peach

DINNER

Orange juice
Rice
Cooked pear
Fruit cup
Stewed rhubarb

Friday

BREAKFAST

Orange juice
Rice
½ Grapefruit
Blueberries
Peach

LUNCH

Prune juice
Rice
Banana, sliced
Apricots
Strawberries

DINNER

Orange juice
Rice
Baked apple
Loganberries
Stewed prunes

COLD WEATHER MENUS

Saturday

BREAKFAST

Orange juice
Rice
½ Grapefruit, broiled
Cranberry sauce
Raspberries

LUNCH

Pineapple juice
Rice
Cooked pear
Blueberries
Baked apple

DINNER

Orange juice
Rice
Stewed peaches
Plums
Blueberries

Sunday

BREAKFAST

Orange juice
Rice
Apple sauce
Queen Anne cherries
Banana, sliced

LUNCH

Prune juice
Rice
Raspberries
Fruit cup
Rhubarb

DINNER

Orange juice
Rice
Baked pear
Loganberries
Apricots

HOT WEATHER MENUS

Monday

BREAKFAST

Orange juice
Rice
Cantaloupe
Gooseberries
Stewed figs

LUNCH

Pineapple juice
Rice
Stewed grapes
Apricots
Peach ice cream

DINNER

Loganberry juice
Rice
Watermelon
Blueberries
Banana, sliced

Tuesday

BREAKFAST

Orange juice
Rice
Currants
Cantaloupe
Stewed peaches

LUNCH

Lemonade
Rice
Stewed figs
Banana, sliced
Fruit cup

DINNER

Grape juice
Rice
Blueberries
Baked apple
Peach ice cream

HOT WEATHER MENUS

Wednesday

BREAKFAST

Orange juice
Rice
Apricots
Honeydew melon
Blueberries

LUNCH

Pineapple juice
Rice
Banana, sliced
Stewed prunes
Watermelon

DINNER

Grape juice
Rice
Strawberries
Baked pear
Strawberry ice cream

Thursday

BREAKFAST

Orange juice
Rice
Blueberries
Stewed prunes
Queen Anne cherries

LUNCH

Grape juice
Rice
Stewed figs
Cantaloupe
Raspberries

DINNER

Orangeade
Rice
Watermelon
Stewed peaches
Blackberries

HOT WEATHER MENUS

Friday

BREAKFAST

Grapefruit juice
Rice
Cantaloupe
Raspberries
Red currants

LUNCH

Cranberry juice cocktail
Rice
Rhubarb
Blueberries
Banana ice cream

DINNER

Orange juice
Rice
Apricots
Strawberries
Baked pear

Saturday

BREAKFAST

Orange juice
Rice
Baked pear
Blueberries
Cantaloupe

LUNCH

Peach juice cocktail
Rice
Frosted grapes
Strawberries
Prune ice cream

DINNER

Cherry cocktail
Rice
Banana mousse
Rhubarb
Baked apple

HOT WEATHER MENUS

Sunday

BREAKFAST

Orange juice
Rice
Cantaloupe
Currants
Blueberries

LUNCH

Loganberry cocktail
Rice
Grapes
Applesauce
Peach ice cream

DINNER

Grape juice
Rice
Fruit cup
Rhubarb
Coupe Saint Jacque

Monday

BREAKFAST

Orange juice
Rice
Rhubarb
Baked apple, cold
Fruit cup

LUNCH

Pineapple orangeade
Rice
Blueberries
Cantaloupe
Raspberry sherbet

DINNER

Lemonade
Rice
Strawberries
Watermelon
Pears with orange ice

HOT WEATHER MENUS

Tuesday

BREAKFAST

Orange juice
Rice
Currants
Cantaloupe
Stewed peaches

LUNCH

Pineapple juice
Rice
Stewed grapes
Frozen peaches
Watermelon

DINNER

Orangeade
Rice
Rhubarb
Blueberries
Raspberry ice cream

Wednesday

BREAKFAST

Grapefruit juice
Rice
Rhubarb
Stewed figs
Apricots

LUNCH

Grape juice
Rice
Baked apple, cold
Pineapple sherbet
Cantaloupe

DINNER

Lemonade
Rice
Strawberries
Seewed peaches
Blackberry sherbet

HOT WEATHER MENUS

Thursday

BREAKFAST

Orange juice
Rice
Honeydew melon
Blueberries
Apricots

LUNCH

Orangeade
Rice
Raspberries
Queen Anne cherries
Prune ice cream

DINNER

Grape juice
Rice
Stewed figs
Watermelon
Pineapple sherbet

Friday

BREAKFAST

Grapefruit juice
Rice
Cantaloupe
Strawberries
Stewed prunes

LUNCH

Lemonade
Rice
Blueberries
Frosted grapes
Apricots

DINNER

Orange juice
Rice
Rhubarb
Queen Anne cherries
Banana ice cream

HOT WEATHER MENUS

Saturday

BREAKFAST

Orange juice
Rice
Honeydew melon
Stewed figs
Apricots

LUNCH

Loganberry juice
Rice
Banana, sliced
Blueberries
Peach ice cream

DINNER

Orangeade
Rice
Gooseberries
Rhubarb
Melon & frosted grapes

Sunday

BREAKFAST

Orange juice
Rice
Cantaloupe
Stewed peaches
Applesauce

LUNCH

Grape juice
Rice
Strawberries
Baked apple, cold
Banana ice cream

DINNER

Lemonade
Rice
Blueberries
Frozen peaches
Apple sherbet

DANGERS TO BE AVOIDED BY RICERS IN THE PURCHASE OF FOOD

There are certain dangers which have been brought to the attention of physicians in the purchase of certain foods for rice patients. One of the chief offenders is the unwary consumption of salt.

The whole purpose of the rice diet is to keep the body as free from salt intake as is compatible with the continuance of life. For cases which have undertaken the diet principally to reduce or keep in check high blood pressures, which are not, as yet, in the danger bracket, all of the following considerations may not apply. For serious cases of kidney destruction, as chronic or acute nephritis or nephrosis, life may be terminated by a sudden increase in salt. It is for this reason the following is so important in the purchase of food for Ricers.

1. Fresh water fish is sometimes allowed in the Ricer's diet. Salt water fish is never allowed. Therefore, fresh water fish shipped and packed in salted ice is prohibited.

2. Raw meat which has been cut and displayed in open meat trays in refrigerated store counters is dangerous. The counters and trays are too often sprayed with a cleansing and refrigerating solution of sodium chloride (salt). Contamination is unavoidable. Meat for the Ricer should be freshly cut from an inside piece.

3. Ground meats prepared by meat grinders in butcher shops may be contaminated by salt products previously put through the machine. Contamination also may affect the meat by cleaning solutions used on the machine parts (these are usually chloride solutions).

4. Frozen vegetables which contain preservatives of a harmful type, such as those used to retain the color and improve the

appearance of the vegetables, should not be used. The usage of chemicals for this purpose is so widespread that the use of all frozen vegetables is prohibited. Use only fresh vegetables.

5. The use of commercially-made jellies, jams and conserves is prohibited. Use only home-made products in which fruit juices, whole fresh or canned fruits, fresh fruits, sugar and water are used.

6. Do not use any commercial maple sugar. Maple sugar, itself, could be used, except that in the manufacture of maple syrup the woodsmen usually add bacon fat—as previously explained.

7. Do not use brown sugar. The by-products in the metabolism of brown sugar are harmful to the Ricer.

8. Do not lick gummed labels or stamps. Cases have shown salt in their urinanalysis.

9. Commercial brands of rice flour are prohibited. During the manufacture, a chemical change takes place in the baking process which renders rice flour unsuitable for use on the rice diet. You may grind your own rice.

10. Wash your dishes and utensils in clear water, hot or cold. The use of all soaps, soap powders, or commercial cleansers in the washing of dishes or cooking utensils is prohibited.

11. All dried fruits are prohibited in the diet, except prunes, and the occasional use of a few sun-dried raisins. Dried fruits are forbidden, because in the preparation of them chemical sprays are used. This makes them a potential danger to the Ricer. Unfortunately, some manufacturers of these products do not adhere to the label "sun-dried," which should mean that no chemicals or processes for drying have been used..

12. Do not use nuts, dates, avocados, tomato juice or any vegetable juices.

13. No corn syrup or products made with corn syrup are allowed.

14. Hard candies with artificial flavoring or coloring matter cannot be eaten. Home-made candy made from granulated sugar, dextrose, natural fruit juices, fruits, are permitted.

COOKERY PROCESSES—FOR RICERS*

The following are the commonly used cooking processes:

With moist heat;

BOILING is cooking in water or other liquid at a temperature at which bubbles rise continually to the surface and break.

BRAISING is browning in a small amount of mineral or Wesson oil and then cooking at a simmering temperature in a small amount of water.

SIMMERING is cooking in liquid at a temperature of about 185° F., at which bubbles form slowly and break below the surface.

STEAMING is cooking in steam with or without pressure.

STEWING is cooking or boiling in a small quantity of liquid. When applied to meat, simmering temperature is used.

With dry heat;

BAKING is cooking in the oven, on metals, stones, or in ashes and under coals. When applied to meat it is called ROASTING.

BROILING is cooking by radiant heat from a flame, electric element, or open fire.

PAN-BROILING is cooking in a hot uncovered frying pan without the addition of mineral or Wesson oil.

With Mineral or Wesson oil;

FRYING is cooking in Mineral or Wesson oil, applied especially: (1) to cooking in a small amount of oil, also called

* From *Meat Cookery Definitions*. Cooperative Meat Investigations Adapted for Ricers.

SAUTEING; (2) to cooking in a deep layer of oil, called DEEP-OIL FRYING.

Cooking Hints and Equipment

To prevent discoloration of fruits, such as sliced bananas, sliced apples, etc., add several drops of lemon juice. Mix fruit with lemon.

Distilled water should be used in cooking only if the patient's physician finds the salt level does not reduce quickly enough.

The use of an electric chopper, such as the Waring Blender, or any other blender, makes possible many recipes which otherwise could not be made. A banana, for example, broken down by a blender becomes a creamy, smooth, velvety mass, about the consistency of ice cream. The choice of diets can thus be varied to a far greater degree. Its use is indispensable to the Ricer.

A small hand grinder is also a necessary adjunct. This should have gears fine enough to make rice flour.

A postal scale is invaluable in weighing the Ricer's small amounts of food permitted in single servings.

Stir-Frying

For decades the Chinese have used the method of cooking known as stir-frying. Stir-frying is sauteing very fast for a short time in hot oil in a shallow pan. Use a pan with curved sides, rather than the ordinary straight-sided skillet; the heat is then more evenly distributed over the pan surface. The food is covered and cooking continues slowly until done. The time depends, of course, on what is being cooked, but averages 3 to 8 minutes. This method is particularly adaptable for cooking small quantities of food as used by the Ricer.

THE AUGMENTED RICE DIET

SUPPLEMENTARY FOODS

After you have completed your three months basic training, you can usually look forward to an increase in diet. You must bear in mind that the abuse which you have subjected your body to for years, either by overwork, bad eating habits, overweight, bad living habits (whether expressed in smoking too much, drinking too much, or otherwise), has taken its toll in actual cell destruction. The three months of basic diet has accomplished one thing primarily, that is, it has removed the excess strain from your kidney, heart and vascular systems. The body, however, has not had time to apply itself to a healing process. This will take many more months of great care on your part. For years, the medical profession believed that the kidney cells and heart cells had no power of repair. Looking backwards, it is easy now to say, of course, that the fallacy of this belief should have been evident. There must have been a constant and steady repair, as with any of the other cells of the body, to keep up with the natural cell metabolism. Doctor Kempner, during his research work on the metabolism of the kidney cell, concluded that when the kidneys are damaged they must be given a rest so as to allow them time for repair. For this reason, a bland diet which causes no irritation to the kidney cells, is indicated.

The least irritating vegetables have been found to be the following: tomatoes, cabbage, collards, beets, turnips, carrots, lettuce, other salad greens, spinach, broccoli, cauliflower, sprouts, squash, egg plant, cucumbers, green peppers, asparagus, onions, parsley. These may be eaten raw, steamed or boiled without salt, flour, milk or fat of any kind, except mineral oil.

Which of these vegetables you will be allowed to add to your basic diet menu depends on the blood chemistries and urinanalysis results found in your three months of basic training.

This will be determined by your physician. There is one important factor to be considered—the additional foods should be added very slowly over a period of several months. This gives the body a chance to adjust itself to the new foods.

If patients with severe kidney disease still find the diet (even with the addition of a few vegetables) both monotonous and "boring," they will be reconciled to it if they remember that it is only a strict adherence to the diet that keeps them alive. Ten years ago, all the physician could say was, "You have three months in which to put your affairs in order," and—all too often—his prognosis was correct.

Tea

Tea is usually permitted on the rice diet after the 100 day induction period. It supplies a warm popular drink in cold weather.

Coffee

The use of coffee is forbidden to the Ricer.

Bread

The use of baked goods is forbidden to the Ricer, because flour itself contains salt.

There are several rice breads on the market, none of which, unfortunately, are very palatable and all dry too quickly for practical use.

Yeast bread keeps fresh longer than do breads made of baking soda, or baking powder. If bread is allowed by your physician, it should be made of yeast, for the amount of sodium in yeast is very small. Packaged yeast may now be obtained, in the form of tiny, dry granules.

Vinegar

After the completion of the 100 day basic rice diet period, the use of white vinegar, and of honey vinegar, is permitted to the Ricer.

White vinegar (or spirit vinegar) is made from dilute alcohol.

Honey vinegar can be made at home. Mix one quart of strained honey with eight quarts of warm water, and allow the mixture to stand until fermentation ceases. Pour into clean jars and seal. Honey vinegar is white in color and of excellent quality.

Ricers must not use cider vinegar.

Spaghetti

Spaghetti, noodles, vermicelli and macaroni—all are made from hard wheat. They are 85% carbohydrate and 10-13% protein. Although they contain a small amount of salt—as every food does—they have a valuable place (after the 100 day basic diet) in the menu of the Ricer, suffering from severe kidney disease and losing weight. If your physician allows you two ounces a couple times a week, they make a nice supplement to the diet. The Ricer may put them in soup, or eat them with jelly, jam, or any sauce which is permitted.

The secret of good spaghetti, or any of its allied products, is to drop them into rapidly boiling water. There should be ample room for the spaghetti to move about freely during the boiling process. After about ten minutes of boiling, test with a fork to see whether tender. Overcooking should be avoided The spaghetti should then be drained and rinsed.

WHEN VEGETABLES ARE PERMITTED

Vegetables are washed and cleaned before being weighed. When several vegetables are allowed it is easiest to weigh them altogether. A transparent round container is best to use with the postal scale for weighing. It is very easy to arrange your daily quota this way. Many Ricers have found it convenient to cook their quota of vegetables for 2 or 3 days and store in glass containers in the refrigerator. When intending to do this, it is better to under-cook the vegetables for the next day's consumption. Warming the vegetables next day will finish the cooking process. When visiting or traveling, a series of small jars may be prepared this way. They can be transported in a wide-mouth thermos jar and refrigerated by adding ice to thermos as often as necessary. A can of Sterno may conveniently be used to heat vegetables on picnics or trips.

Potatoes

Potatoes are one of the first vegetables which are permitted on the diet. Beneath the skin of the potato are the vitamins. These vitamins must be sacrificed by the patient because the skin of the potato is loaded with minerals. These minerals are detrimental to the Ricer and must not be eaten. Medium-sized potatoes should be used.

Boiled Potatoes

For boiled potatoes select potatoes of uniform size for cooking whole so all potatoes will be evenly cooked in the same length of time. Scrub under running cold water with a stiff vegetable brush. Remove any sprouts or bruised spots with a sharp paring knife. As a general rule, boil potatoes without paring, to conserve food value. If they must be pared first to save time when the meal is

served, use a sharp knife or special vegetable parer and keep parings as thin as possible. Cover potatoes with boiling water. Cover and cook over medium heat 25-40 minutes, depending on size, or until tender when tested with a fork. Drain off water. Hold each potato on a fork and remove skin with paring knife.

Parsley Potatoes

Potatoes
1 tablespoon Wesson oil
1 tablespoon parsley, chopped

Melt one tablespoon Wesson oil in a saucepan; add 1 tablespoon chopped parsley. Drop cooked, pared potatoes into Wesson oil and turn them over and over until well-coated with oil and parsley.

Baked Potatoes

Select large baking potatoes of uniform size. Scrub under running cold water with a stiff vegetable brush. Bake on the oven rack or on a baking sheet in very hot oven, 450°-500°F., 45 minutes to 1 hour, depending on size. Test with a fork. If fork penetrates easily to center of potato, it is done. Break skin to allow steam to escape, to prevent sogginess. Do not eat the skin.

Potato Pancakes

Potatoes
1 teaspoon mineral oil
1 teaspoon parsley, chopped
1 slice onion, chopped

Potato pancakes may be made from boiled potatoes. Simply mash, add 1 teaspoon chopped parsley, 1 teaspoon mineral oil for each potato, and 1 slice of onion chopped very fine. Mold into flat pancakes.

French Fried Potatoes

Potatoes
mineral oil

Cut the peeled raw potato into thin potato strings no more than ¼ inch wide. Heat mineral oil and drop potato strings into boiling oil. Keep turning the potato strings until well browned.

Saltless Potato Chips

Potatoes 4 ounces mineral or Wesson oil

Into a 6 inch skillet pour 4 ounces of oil. Peel and slice amount of potato allowed. Slice with a potato slicer. Drop 3 or 4 slices at a time into hot fat and brown, turning frequently until crisp. Lay out on brown paper to drain. One good-sized potato absorbs 1½ teaspoons of oil in the cooking. Oil can be reused.

Stuffed Potato

¼ teaspoon parsley, chopped
Potatoes
¼ teaspoon mineral or Wesson oil
¼ clove garlic, crushed

Cut baked potato so as to open lengthwise. Scoop out potato, and mash. Add ¼ teaspoon mineral or Wesson oil, ¼ teaspoon chopped parsley and ¼ clove crushed garlic. Mix well and return to potato shell and bake for 2 minutes at 375°.

Potato Pudding

Potatoes
4 tablespoons cooked rice
grated onion
¼ teaspoon sugar

Grate a raw potato which has been previously peeled. Add a little grated onion for taste. Mix in the following: 4 tablespoons of cooked rice; ¼ teaspoon sugar. Bake in individual oiled pyrex dish for 45 minutes at 350°.

Glazed Potatoes

Honey potatoes lemon juice

Boil new potatoes in their jackets, peel potatoes when soft, cover potato with honey syrup made by mixing ½ honey and ½ lemon juice; cover potato with mixture, and bake in casserole which has been wiped with mineral or Wesson oil.

Glazed Carrots

Carrots

½ cup sugar

1 lemon, juice

Take small carrots or slice two large carrots lengthwise. Parboil for about 6 minutes, until not quite ready to eat. Caramelize ½ cup of sugar, add juice of 1 lemon and cover carrots. Bake in medium oven 15 minutes.

Glazed Onions

Take small white onions and treat same as recipe for glazed carrots.

Glazed Parsnips

Take small parsnips and treat as for glazed carrots.

WHEN MEAT IS PERMITTED

Ricers with families are in much better position when it comes to purchasing their supplies of meat. The amounts of meat permitted after the basic diet is completed are very small and must be weighed out on a postal scale in ounces. To the average housewife, feeding a healthy family such small quantity purchases as needed for a Ricer's meal, is entirely foreign.

For example, some Ricers are allowed only one ounce of meat twice a week by their physician. A rib lamb chop about one-half an inch thick has an eye which weighs about one ounce. All meat must be *lean.*

Cooking Time

Oven Temperatures for Baking

Slow oven: 250-350°F.
Moderate oven: 350-400°F.
Quick oven: 400-450°F.
Very hot oven: 450-550°6.

BROILING TIME

Meat

Chops, lamb, mutton or veal: 15-20 minutes
Steak—½ inch thick: rare—10 minutes; medium—12 minutes; well-done—15 minutes.

Poultry

Chicken-broilers: 20 minutes; roaster: 30 minutes
Quail—medium-sized: 10-20 minutes
Squab—large: 10-20 minutes

Roasting Time

Meats

Meat in casserole 2-2½ hours	350°F.	Meat pie with rice pie crust (previously cooked meat) 450°F. 25 minutes

Beef

		Minutes per pound
Rare	300°F.	18-20 minutes
Medium	300°F.	24-26 minutes
Well done	300°F.	27-30 minutes

Lamb and Mutton

Medium	300°F.	30-35 minutes
Well done	300°F.	30-35 minutes

Veal

	300°F.	25-30 minutes

Poultry

Chicken	325°-350°F.	
Turkey	300°-350°F.	15-20 minutes
Guinea hen	325°-350°F.	30-35 minutes

Chopped ground beef lends itself well to weighing into small quantities. Buy half a pound of top or bottom sirloin steak, chuck, club or pot roast. All are lean beef cuts. Chop meat in your own meat grinder (for reasons given elsewhere in book). Weigh out amounts permitted for individual meal. Prepare for refrigerator between waxed paper. Meat will keep indefinitely this way if you get it quickly enough into your freezer. It should not be allowed to get warm.

Veal chops have the least fat content of any and are a good choice for the Ricer.

Meats should be lean meats such as steaks, lamb, chuck steak. Every particle of fat must be removed from raw meat before cooking.

LAMB STEW:

Place meat on shallow pan and sear meat under broiler until brown, 450°F. Add onion grated. Cover with orange juice and simmer slowly until fork can separate meat fibers easily. Serve with white boiled rice and slice of cranberry sauce.

POT ROAST:

Use cuts of chuck steak, porterhouse steak, top sirloin steak, or bottom round steak. Sear meat on all sides in mineral oil. Cook slowly and keep covered until done.

HASH:

Grind cooked meat. Mix with cooked rice in any proportion, (50-50 is very palatable and doubles the bulk). One tablespoon lemon juice improves the flavor. Bake 20 minutes in hot oven.

POULTRY:

Chicken, turkey, quail, partridge, guinea hen may be used. The fat glands of poultry are numerous and found in the skin. For this reason, the Ricer should remove the skin from the bird before cooking. The white or breast meat of poultry is the least fatty part of the bird.

BOILED CHICKEN:

The parts to be prepared for the Ricer's consumption may be stewed in half a cup of water in a pressure cooker. Cooking time is ten minutes at 15 lbs. pressure.

BROILED CHICKEN:

White breast of chicken. Remove skin. Wipe with garlic. Broil both sides. Average cooking time, 20 minutes, 450°F.

CROQUETTES:

Grind meat or poultry which has been previously cooked. This is a good recipe for meat left over from the day before. Mix with previously well-cooked washed rice. Make into hash and mold into croquettes. Grate some lemon peel to mixture if desired. Bake 20 minutes in a hot oven.

WHEN FISH IS PERMITTED

FISH

Fresh Water Fish

Bass—large or small mouth
Catfish
Pike
Salmon—fresh water
Sturgeon
Trout—Salmon
Brim
Carp
Perch
Red Breast (Robbins)
Sun Fish
Trout—Lake
White Fish

Baked Fresh Fish

Place the fish skin side down in a pyrex dish greased with Wesson oil. Place one slice of grated onion and a slice of tomato on top. Sprinkle a few drops of white vinegar over top. Bake in a moderate oven (400°F.) for 20 to 30 minutes, depending upon thickness of fish. Brown. Fish can be finished under broiler if not sufficiently browned.

Baked Stuffed Fillets

Cut into slices one peeled ripe tomato and mix with one tablespoonful minced onion and one teaspoon chopped green pepper. Add one teaspoonful Wesson mix. Place on fillet and then roll. Tie with strong white thread. Place in pyrex dish greased with Wesson oil and bake in slow oven for one hour.

Steamed or Boiled Fish

Thick pieces of fish are best cooked by steaming or boiling. Place fish on the rack of a steamer over steaming water. Cook until fish flakes separate readily with a fork. 25 to 40 minutes. Serve with tomato-onion sauce. When boiling fish, add a sprig of parsley chopped fine.

Planked Fish

The fish should be oiled thoroughly with Wesson or mineral oil. Arrange the fish skin down on plank or pyrex platter. Brush with mixture of two tablespoonfuls Wesson oil, one tablespoonful white cider, one tablespoonful finely chopped parsley and one teaspoonful minced onion. Bake for 25-30 minutes at 400°F.

Prepare mashed potatoes while fish is cooking and such vegetables as permitted. Surround cooked fish with a border of the mashed potatoes and vegetables. Cover fish with a tomato sauce. Garnish with parsley.

Fish Cakes—Potato

1 cup boned fish
1¼ cups cooked rice
1 sprig parsley, chopped
1¼ cups mashed potato
1 tablespoon minced onion
½ tablespoon Wesson or mineral oil

Mix well and form into flat round fish cakes, desired size. Brown both sides.

Fish Hash

1 cup boned fish
½ tablespoon Wesson or mineral oil
1 cup apple juice
2 cups diced potatoes
1 tablespoon lemon juice

Shred cooked fish to be used. Put potatoes and fish in a saucepan, cover with lemon juice and apple juice and cook 10 minutes until potatoes are tender. Drain fish and potatoes and save liquor. Mix with one cup rice paste (one cup cooked rice in Waring Blender), heat, mixing in liquor until light and creamy. Spread over well-oiled frying pan and cook slowly until browned on bottom. Serve folded over on itself as you would an omelet. Serve hot and garnish with finely chopped parsley.

Fish Cakes—Rice

Take allotted amount of boned fish, (left-over fish may be used) and mix with equal amount of cooked white rice. Use fish juice to make even mixture. Mold into fish cakes and bake in well-oiled pyrex pie dish for 15 minutes (until brown). Serve with tomato sauce.

Salmon Box

1 cup cooked rice
1 tablespoon lemon juice
2 tablespoons green pepper, chopped
1 cup boned salmon
1 tablespoon parsley, chopped
¼ cup tomato juice*
2 tablespoons oil

Line an oiled (Wesson or mineral) baking dish with rice, keeping ¼ cup for the top. Mix the flaked salmon, (or other fresh water fish) with rest of ingredients into center of rice. Cover with rice and bake or steam in a pan of water (350° to 375°F.) for 35 minutes. Unmold on platter and serve with parsley sauce.

* Use home-made tomato juice only. See recipe, page 111.

WHEN EGG WHITES ARE PERMITTED

Caramel Frosting

1 cup sugar
2 egg-whites
½ cup apple juice
½ teaspoon lemon peel, grated

Make a syrup of the apple juice and sugar and cook to the soft-ball stage (238°). Remove from fire and cool while the egg whites are beaten, then pour the syrup in a thin stream on to the stiff whites, beating constantly until thick enough. Add grated lemon. Use on puddings.

Lemon Frosting

½ cup confectioners sugar
1 egg-white
1 teaspoon lemon peel, grated

Incorporate the stiff beaten egg white slowly with the confectioners sugar. When smooth, add the grated lemon. Serve on desserts. Also put in center of cookies.

Lemon Frost - Beverage

Lemonade
sugar
egg-white
lemon juice

Fill a tall glass one-fourth full of ice-cold lemonade and top with a spoonful of stiffly beaten egg-white sweetened slightly and flavored with lemon juice. This recipe may be altered by substituting apple juice instead of lemonade and flavoring the whipped egg with grated lemon peel. If desired, powdered sugar may be added as a sweetening to the beaten egg whites.

Prune Whip

⅓ cup sugar
1½ tablespoons lemon juice
1½ cups prune pulp
3 egg whites

Mix pulp, lemon juice together. Beat sugar into stiffly beaten egg

whites, fold in fruit mixture. If desired, this mixture may be piled lightly into an oiled baking dish and baked at 275°F. 30 to 45 minutes.

Rhubarb Scallop with Meringue

½ pound rhubarb
1 cup granulated sugar
2 tablespoons powdered sugar
2 egg whites
rice cake
1 orange, rind

Wash and peel rhubarb and cut into 1-inch pieces; add sugar and orange rind, mixing well. Cut rice cake into thin slices; line bottom of greased baking dish with 3 or 4 slices; cover with ¾ of rhubarb. Continue to make alternate layers of cake and fruit until material is used. Cover with meringue and bake in moderate oven, (350°F.) for 30 minutes.

Meringue for Pies and Desserts

Egg-whites sugar

Beat egg whites until stiff; add sugar slowly, beating until blended. Pour on baked pudding and bake 15 minutes longer, or until meringue is slightly browned. Use on any hot dessert.

DRYING FRUITS AND VEGETABLES

A time table for blanching and drying fruits and vegetables for winter use has been included for the use of patients on the rice diet who do not have access to frozen fruits and vegetables all year and must depend upon other sources. Home dried fruits or vegetables are safe. Commercially dried fruits and vegetables are often contaminated by sulphur or some other quick drying agent. Others have been partially dehydrated by soaking first in salt water. Such a method is of course death to the patient trying to lower his own salt renal threshold. Dried fruits and vegetables are usually dipped in salt solutions (mace) to help to prevent discoloration. This is why the Ricer should dry his own fruits and vegetables.

Methods:—

1. Sun Drying.
2. Artificial Heat.
3. Dry by Air-Blast (with electric fan.)

TIME TABLE FOR BLANCHING AND DRYING FRUITS AND VEGETABLES

	Blanching Time (Minutes)	Drying Time (Hours)	Temperature Fahrenheit
Vegetables			
Sweet Corn	To loosen skin	3 to 4	110-145
Carrots	5 to 10	2½ to 3	110-150
Onions	6	2½ to 3	110-140
Pumpkin	5	3 to 4	110-140
Celery	3	3 to 4	110-140
Swiss Chard	3	3 to 4	110-140
Peppers	3	Dry thoroughly	110-145
Spinach	.....	3	110-140
Tomatoes	4-6		110-145
Fruits	Not necessary to blanch		
Plums	Cut in halves, remove pits	4 to 6	110-150
Apricots	Cut in halves, remove pits	4 to 6	110-145
Peaches	Cut in halves, remove pits	4 to 6	110-150
Apples	Pare, core, slice	4 to 6	110-150
Quinces	Peel, core, slice	4 to 6	110-150
Pears	Pare, core, slice	4 to 6	110-150

Drying Apples, Pears or Quinces*

Pare, core and cut the fruit in eighths, or core and slice in rings, ¼ inch thick. As fast as a small amount is ready, drain and dry surface moisture on cheese cloth. Spread on trays, dripping pans or platters or spread cheese cloth on over racks. Slide into a cold oven, light both gas burners, for two minutes, or until the temperature registers 110° F. Then turn off one burner, reduce the other to the lowest possible point, leave the oven door open an inch and increase the temperature to 150° F. The fruit will be done when it is so dry that it is impossible to press water out of the freshly cut ends. It should be leathery and pliable but not so dry that it will snap or crackle. Will take from 4 to 5 hours. Cool quickly. Store in paper bags tying the necks with string, and painting them all over with melted paraffin. In turn store these bags in a tightly closed tin container.

Pears and quinces may be steamed 10 minutes before drying.

To Cook Dried Apples, Etc.

Soak 6 to 8 hours, or overnight, using 3 parts of water to 1 part of apples. Two hours' soaking is sufficient for thinly sliced apples.

Drying Berries

Blueberries, currants, gooseberries, raspberries, cherries and grapes can be dried. The length of time required is from six to eight hours. Use only sound, unbruised fruit; wash clean and drain on platters and dry in oven. Be careful that the oven is not too warm in the beginning. A low temperature, 110° F., at first will be about right. If this is gradually raised to 130° or 140° F., the best results will be produced.

The drying should be stopped as soon as the berries fail to stain the hand when pressed, but not so hard that they will rattle. This will take from four to five hours.

To Cook Dried Berries

Soak 4 or 5 hours, using 1½ parts of water to 1 part of raspberries. Cook in the same water 20 minutes and sweeten to taste. Use in the same way as fresh raspberries.

* *The Settlement Cook Book* (Mrs. Simon Kander).

For Preserving Fruits

ESTIMATED AMOUNT OF FOOD AND NUMBER OF JARS NEEDED

Perhaps more than any other question, except about processing, women want to know how much to buy or pick to make a certain number of jars of finished product. Of course, this will vary a good deal, depending on method of canning, and percentage of syrup or liquid in each jar. In general, however, the following table will be helpful in estimating your needs:

Fruit	*Measure*	*Weight*	*Qt. Jars*
Apples	1 bushel	47 to 50 pounds	20
Apricots	4 basket crate	20 pounds net	12
Berries	1 bushel	48 pounds	24
Blackberries	16 qt. crate	22 pounds net	12
Red Raspberries	12 qt. crate	16 pounds net	8
Strawberries	16 qt. crate	22 pounds net	8
Cherries	16 qt. crate	22 pounds net	12
Peaches	1 bushel	48 to 50 pounds	25
Pears	1 bushel	50 to 58 pounds	30
Pears	1 peck	14 pounds	6
Pineapples	1 crate, diced	30 pounds	16

Steps in Open Kettle Method

1. Sterilize jars and rubbers.
2. Prepare fruit.
3. Heat sugar, or honey, and water until sugar is dissolved.
4. Add fruit and cook until fruit is tender.
5. Pack in sterilized jars inserting a silver fork between fruit and jar to break up any air bubbles.
6. Wipe top carefully, fit rubbers, put on top and seal at once.
7. Invert jar on table to cool and to be sure it does not leak.
8. Store in cool, dark place.

Steps in Cold Pack Canning

1. Sterilize jars and rubbers.
2. Prepare fruit.
3. Heat sugar and water to boiling.
4. Pack fruit in sterilized jars.
5. Pour syrup over fruit.
6. Place rubbers on jars.
7. Place covers on jars—not tight.
8. Place jars in hot water bath, and sterilize required length of time, as given in above table. Count time when water begins to boil.
9. Remove from bath, screw cover down tight, invert on table to cool and to be sure they do not leak.
10. Store in dark place as light fades the color of the fruit.

CANNING TIME TABLE FOR STANDARD FRUITS

Product	Method of Treatment before Canning	Hot-Water Bath Boiling (min.)	Oven 275° F. (min.)	Syrup
Apples	Wash—quarter or halve—rinse—boil 1 minute—pack—cover with boiling syrup. Or—Boil whole in syrup until tender or bake as for serving, and cover with syrup—pack hot. Or—Pack hot in form of apple sauce.	15	35	Thin
Apricots	Wipe with damp cloth—do not peel—blanch—halve and pit—pack—cover with boiling syrup.	20	35	Medium
Berries (Except Strawberries)	Wash—stem—pack in jars—cover with boiling syrup	20	35	Medium
	Or pre-cook and pack hot	5	20	
Cherries	Wash—stem—pack in jars—cover with boiling syrup			Sweet—Medium
Sweet	Or remove pits, add sugar as desired, bring to boil and pack	20	30	Sour—Thick
Sour		5	20	
Currants	Wash—stem—pit—pack—cover with boiling syrup	20	30	Medium
	Or pre-cook and pack hot	5	20	Medium
Figs	Wash—place in soda bath—drain—rinse—cover with boiling syrup	20	35	Thick
Gooseberries	Same as other berries	20	30	Thick
Grapes	Same as berries	20	30	Medium
Peaches	Select firm, ripe peaches—blanch—cold-dip—peel—pack—cover with boiling syrup	20	35	Medium
Pears	Select slightly under-ripe pears — pare — quarter — rinse—boil in syrup—pack—cover with boiling syrup	20	35	Medium
Pineapple	Peel—remove eyes—cut, slice or shred—pack cold—cover with boiling syrup	30	45	Thin

Product	Method of Treatment before Canning	Hot-Water Bath Boiling (min.)	Oven 275° F. (min.)	Syrup
Plums	Wash—prick skins—pack cold—cover with boiling syrup	20	45	Medium
	Or bring to boil, using sugar as desired—pack hot into jars	5	20	Medium
Rhubarb	Wash—cut into small pieces—pack—cover with boiling syrup	20	30	Thick
Strawberries	Wash—stem—pack—cover with syrup—let remain in syrup several hours—re-heat—fill jars—seal	20	35	Medium
	Or to each quart add 1 cup sugar and 2 tablespoons of water. Boil slowly 15 minutes. Let stand over night in the kettle. Re-heat to boil—fill jars hot	5	20	
Fruit Juices	Crush fruit—heat slowly—strain—pour into jars	30 (180° F.)		

NOTE: If canning fruit in Steam Pressure Cooker, process at 5 pounds pressure for 10 minutes if packed cold; for 5 minutes if packed hot with the following exceptions—process Apricots, Figs and Peaches 10 minutes; Pears 8 minutes; Pineapple 25 minutes.

SYRUP TABLE FOR FRUITS

Syrup	Proportions Sugar and Water	Directions
Thin Syrup	1 part sugar to 3 parts water	Boil sugar and water together until sugar is dissolved
Medium Syrup	1 part sugar to 2 parts water	
Thick Syrup	1 part sugar to 1 part water	Fruit juice may be used instead of water.

The syrup specified in the above time table is recommended by the United States Department of Agriculture. Many housewives prefer a sweeter and somewhat thicker syrup. Those who do will find the syrups shown in the individual recipes satisfactory.

Directions for Canning Tomatoes *

Select ripe tomatoes. Do not use over-ripe ones or those from which decayed spots have been removed. They are inferior in flavor.

Wash in cool water.

Place 8-10 tomatoes in wire basket or tie loosely in cheese cloth.

Plunge into actively boiling water for 30-60 seconds, until skin loosens. (If left too long, tomatoes become mushy and hard to peel).

Drain.

Remove core end of tomato and green portions of tomato with a sharp pointed knife.

Remove skins by slipping off with the hand. Be sure black spot at blossom end is removed.

Cut tomatoes into quarters or halves and drop portions into cooking kettle.

Repeat above process until enough tomatoes are prepared to fill jars.

Place over fire and bring to boil and cook for two minutes.

Remove from fire—pour tomatoes into hot jars.

Wipe rims of jars clean and adjust rings and covers. Place in boiling water bath.

(Be sure water is at least one inch over tops of jars, and that jars do not touch each other.)

Process 10 minutes from time water begins to boil.

Remove from water—tighten covers.

Let stand (away from drafts) until cold.

* U. S. Dept. of Agriculture.

CALORIC VALUE OF FRUITS

Variety	*Quantity*	*Calories*
Apple	1 large	100
Applesauce	6 tablespoons	100
Apricots	3, medium	50
Banana	average size	100
Blackberries, fresh	½ cup	50
Blackberries, cooked with sugar	½ cup	200
Blueberries, fresh	½ cup	50
Cantaloupe	½	50
Cherries	10 large	50
Currants, dry	¼ cup	126
Figs	1½ dry	100
Grapefruit	½ average size	100
Grapefruit juice	1 cup	100
Grape juice	½ cup	100
Grapes	20-25	100
Honeydew melon	1/3	100
Huckleberries	¾ cup	100
Loganberries	¾ cup	50
Orange	1 medium	100
Nectarine	1 medium	100
Orange juice	1 cup	133
Peaches, fresh	1 medium	50
Peaches, canned	1, with 3 tablespoons juice	100
Pears, Bartlett	1, medium	50
Pineapple, canned	1 slice, 3 tablespoons juice	100
Pineapple, fresh	1 slice	50
Persimmons	1 large	100
Plums, fresh	3-4 large	100
Prunes	1 average size	25
Raspberries	1 cup	50
Rhubarb, stewed	½ cup	100
Strawberries	½ cup	50
Tangerines	2, medium	50
Watermelon	3/4″ slice	100

JELLY-MAKING*

Jelly making has a special place of its own on the Housekeeping Calendar. Jelly is easy to make if certain rules are followed. It can be made from the fresh fruit juices in late summer and early fall, or from canned fruit juices in wintertime.

Jelly is the product obtained by combining the juice or combination of juices of certain fruits with the right proportion of sugar and cooking the mixture until it becomes a clear, tender, sparkling, transparent, quivering mold.

All fruit juices do not make perfect jelly. To make a good jelly it is essential that the fruit juice contain acid and a natural jelly-making substance called pectin, in proper proportions. (Commercial pectin must not be added).

Some fruits contain proper proportions of acid and pectin to make perfect jelly. Other fruits are deficient in either pectin or acid. Juices from these fruits may be combined with fruit juices which contain sufficient pectin or acid to form a good jelly. Sugar is just as necessary as pectin and acid. Sugar is added but acid must be present in the fruit juice. Either cane or beet sugar may be used in making jelly. Fruits for jelly making in the order of desirability are: currant, crabapple, apple, quince, grape, blackberry, raspberry, and plum.

Making the Jelly (Preparation):

Select and wash fruit. Remove hulls, stems and blossom ends. Cut hard fruits into pieces without peeling or coring.

Extraction of Juices:

For soft fruits, use just enough water to prevent them from sticking, or about one cup water to four quarts fruit. Heat gradually, mash while heating, and cook until the color begins to fade out of pulp.

* Ball Brothers Company, Muncie, Indiana.

For hard fruits, cook with just enough water to cover, until the fruit is soft. Do not mash if you wish to have clear jelly. Strain juice through a wet double cheesecloth or cotton flannel bag, or well sterilized salt sack.

Do not squeeze bag. Clear jelly can be obtained only when juice is extracted by dripping.

A second extraction of juice may be made from the fruit. Return the pulp to kettle, add one cup water to each cup pulp, cook slowly for fifteen minutes, let stand for ten minutes. Strain through one thickness of cheesecloth, squeeze out all the juice possible.

By combining the first and second extractions of juice and straining through four thicknesses of cheesecloth a very satisfactory jelly will be obtained.

Sealing and Storing:

Pour juice while hot into clean hot jelly glasses. Fill the glasses full as jelly shrinks as it cools. Cover at once with hot paraffin. A small teapot or pitcher with a spout is handy for pouring paraffin. When jelly is cold cover jelly glasses with tin lids or tight paper covers.

JELLY TABLE*

Approximate Proportions of Sugar and Fruit Juice for Jelly

(Showing Fruit Juices and Approximate Proportions of Each Which Will Combine to Make Good Jelly)

Fruit Juice	Combine in Following Proportions	Fruit Juice Cups	Sugar Cups	Predominant Flavor
Apple	..	1	3/4	Apple
Apple Blackberry	3/4 1/4	1	2/3	Blackberry
Apple Blueberry	1/2 1/2	1	3/4	Blueberry
Apple Black Raspberry	1/2 1/2	1	2/3	Black Raspberry
Apple Blueberry Rhubarb	1/3 1/3 1/3	1	2/3	Rhubarb
Apple Cherry	1/2 1/2	1	2/3	Cherry
Apple Elderberry	1/2 1/2	1	1	Elderberry
Apple Peach	1/2 1/2	1	2/3	Peach
Apple Pineapple	1/2 1/2	1	2/3	Pineapple
Apple Quince	1/2 1/2	1	2/3	Quince
Apple Quince Cranberry	1/3 1/3 1/3	1	3/4	Cranberry
Apple Rhubarb	1/2 1/2	1	2/3	Rhubarb
Apple Strawberry	1/2 1/2	1	2/3	Apple
Blueberry	..	1	2/3	Blueberry
Crab-Apple	..	1	3/4	Crab-Apple
Currant	..	1	3/4-1	Currant
Gooseberry (Green)	..	1	1	Gooseberry
Grape (Under-ripe)	..	1	3/4-1	Grape

* Ball Brothers Company, Muncie, Indiana.

RECIPES

RICE RECIPES

Crisp rice is plain boiled rice, dehydrated slowly in a moderately hot oven. The rice should be turned several times. Sprinkle white sugar over the rice 5 minutes before removing from oven. Crisp rice reduces to ¼ of the original bulk. Use a cookie tin to spread rice on. Place in oven 300°F. for 2 hours. Leave in oven until cool. To keep crisp, keep in well-closing tin can or cookie jar.

Rice Pudding

Rice
1 teaspoon mineral oil
sugar
1 tablespoon lemon juice

Cook rice until very well done about 40 minutes. Do not wash after cooking. Add sugar to taste and one teaspoon of mineral oil. Bake in individual dishes which have been wiped with mineral oil. One tablespoon of lemon juice may be added to mixture before baking, if desired.

Rice Pancakes

2 cups brown rice
1 tablespoon sugar
apple juice

Put 2 cups cooked brown rice and one tablespoon sugar in a Waring mixer. The rice must not be too dry. Add apple juice to form a batter. Grease pan with mineral oil. Fry on moderately hot pan. Serve hot with apple sauce, jelly or honey.

Rice Cookies, Lemon

1 cup rice pulp
¼ cup sugar
2 tablespoons mineral oil
2 lemons, juice

Cook rice until very soft. Put in a Waring mixer and add juice of 2 lemons to 1 cup of rice pulp; ¼ cup sugar; 2 tablespoons

mineral oil. Drop onto mineral oil greased baking sheet and bake for 7 minutes in a moderate oven, 350°.

Rice Crackers

1½ cups rice
1 tablespoon orange peel
2 tablespoons sugar
1 orange, juice
5 cups water

Cook 1½ cups of rice until soft in 5 cups of water for 30 minutes. Grate 1 tablespoon orange peel, add to rice, plus juice of 1 orange, 2 teaspoons sugar and place in Waring mixer. Spin into a smooth thick paste. Spread on cookie board greased with mineral oil, roll gently to ⅜ inch thickness. Cut into squares and place in cookie tin well greased with mineral oil. Bake in 350° oven until light brown. Serve with jam or jelly.

Rice Cutlets

2 cups cooked rice
½ cup rice paste
orange juice
1 teaspoon sugar
powdered sugar

To 2 cups of cooked white rice add ½ cup rice paste and 1 teaspoon sugar, and mix with enough orange juice so that 2 good sized cutlets are made. Dust with powdered sugar. Bake in oven, 350° until brown on both sides (on baking tin greased with mineral oil). Serve with jelly, if desired.

Pie Crust

4 tablespoons cooked rice
2 tablespoons fruit juice
1 tablespoon sugar
7 raisins

Mix all of the above ingredients in a Waring mixer. This makes enough crust for two individual pies. Pour it over whatever fruit is being used for the pie and bake for 30 minutes. Tart fruits make better pies.

Lemon-Apricot Cookies

1 cup sugar
1 cup cooked rice
1 lemon, juice
1 cup rice flour
2 apricots (canned)
½ lemon, grated rind

Place the lemon juice and apricots in a Waring Blender. Then

add the rest of the ingredients and blend for 2 minutes. Spoon out on a hot cookie tin (using a teaspoon.) Cook in hot oven for 9 minutes at 475°F.

Strawberry Cookies

1 cup cooked rice
1⅓ cups rice flour
1 cup sugar
1 lemon, juice
⅔ cup frozen strawberries

Place in Waring Blender for 1 minute. The consistency of the mixture should be thick and when spooned out onto a hot cookie tin, previously wiped with mineral oil, the mixture should keep its form. Bake in a quick hot oven 475°F. for 9 minutes. The cookies should be turned over and baked for another 4 minutes. They should taste like macaroons and be a delicate shade of pink.

Banana Cookies

1 banana
1 cup rice flour
2 apricots
1 cup sugar
1 cup cooked rice
1 lemon, juice and grated rind

Mash banana, add balance of ingredients and blend in Waring Mixer for 1½ minutes. Spoon out onto hot cookie tin, which was previously oiled. Bake 12 minutes at 475°F in hot oven.

SOUPS

Potato Soup

1 tablespoon celery; chopped
3 potatoes
2 teaspoons onion

Peel potatoes and dice. Add onion, chopped fine, chopped celery and boil until potatoes fall apart. Serve hot. Boiled rice may be added to advantage, if desired. If tomatoes are permitted, add 1 well-chopped slice before boiling.

Mock Tomato Bisque

1 slice onion
1 slice tomato
1 tablespoon celery leaves, chopped
½ cup rice paste
1 cup apple juice

Grate onion, saving juice. Place all ingredients in a Waring Blender for 3 minutes, then put into saucepan. Boil 10 minutes and serve hot with rice crackers.

Puree of Onion

1 onion, grated
1 tablespoon celery, chopped
½ boiled potato
1 cup rice paste
1 cup water

First fry one grated onion in 2 tablespoons of mineral oil. Then boil all the ingredients for 20 minutes and mash them. Serve hot.

Celery Soup

1 stalk celery
1 potato
1 slice onion
½ cup rice paste

Chop celery into small pieces and a medium-sized potato; boil in 1 cup of water. Add 1 slice of onion, grated, and boil for 30 minutes. Add ½ cup rice paste. Serve hot.

Cantaloupe Soup

1 cup diced cantaloupe
½ tablespoon lemon juice
½ cup orange juice

Put in Waring Blender and run 4 minutes. Serve with rice.

Tutti-Fruitti Fruit Soup

1¼ cups fruit salad
1 tablespoon lime juice
1 tablespoon fruit juice
1 tablespoon lemon juice

The fruit salad may be fresh or canned. Put all the ingredients in Waring Blender and run for 2 minutes until thoroughly blended. Serve with rice.

Apricot Soup

3 canned apricots
1 cup pineapple juice, unsweetened

Run 2 minutes in Waring Blender. Serve with rice, chilled.

Cherry Puree

½ quart cherry juice
6 tablepoons rice paste
lemon, rind

Take ½ quart of juice of tart cherries. Add 6 tablespoons rice paste. Grate rind of lemon. Heat the juice and work in rice paste. Then add lemon rind. Serve hot or cold, with rice crackers.

Orange Puree

8 ounces orange juice
¼ cup sugar
4 tablespoons rice paste
1 teaspoon orange rind

Grate orange rind; put all ingredients in Waring Blender and mix. Boil 10 minutes. Serve hot or cold.

RELISHES AND SAUCES

Horseradish Relish

1 horseradish (grated)
2 green peppers (grated)
3 or 4 onions (grated)
1 can cranberry sauce
2 tablespoons vinegar
1 clove of garlic (chopped fine)
2 carrots (grated)
2 apples (grated)
2 tablespoons lemon juice
sugar to taste

Mix all ingredients well and keep in closed jar, makes slightly over 1 quart.

[*Christina Dick*]

Horseradish Cranberry Relish

1 cup cranberries, ground
⅓ cup vinegar
⅓ cup horseradish, grated
1 tablespoon sugar

Mix and let stand 24 hours in the refrigerator before using. This relish may be added to 1 cup of cooked rice which has been in Waring mixer 2 minutes and used as a salad dressing.

Cucumber Relish

1 cucumber, medium
1 teaspoon green pepper, finely chopped
1 tablespoon vinegar
½ teaspoon onion, minced

Pare the cucumber; chop fine; add remaining ingredients and mix well.

Green Pepper Relish

2 cups green pepper, chopped
¼ to ½ cup sugar
1 cup onion, chopped
1 cup vinegar

Wash the onions and peppers; peel the onions; cut the stem end from the peppers; cut the peppers in halves and remove the seeds

carefully. (Holding the halves under running water helps to wash away the seeds.) Chop the peppers and onions in a wooden bowl or grind them in a food chopper, using the fine knife. Drain through a colander. Put the drained vegetables, sugar and vinegar in a saucepan. Boil gently for 20 to 30 minutes. Store in glass or stone marmalade jars; the jars need not be sterilized nor the relish sealed air tight.

Cranberry Ketchup

1 pound cranberries
½ cup vinegar
¼ pound onions
1 cup sugar
½ cup water

Peel onions and chop very fine. Add cranberries and water, cooking until tender (skins burst). Strain through a sieve. Add remaining ingredients and boil until thick; keep stirring until required thickness is obtained.

Tomato Puree

1 tomato
1 thin slice onion
5 celery leaves

Cook all ingredients until tender, then pass through a strainer. Serve hot.

Rice Mayonnaise (Rice Paste Base)

1 cup cooked rice
⅛ cup vinegar
1 slice onion
1 cup mineral or Wesson oil
3 lemons, juice

Place cooked rice, vinegar, oil, lemon juice and onion in Waring mixed. Blend 3 minutes.

Thousand Island Dressing

1 cup rice mayonnaise
1 tablespoon olives, chopped
1 hard boiled white of egg, chopped
1 teaspoon parsley, minced
½ teaspoon fresh horseradish, grated

Mix all the ingredients together until well blended.

Cranberry Relish

1 pound cranberries
1 orange
1 cup honey

Wash berries and oranges and remove all blemishes. Peel orange, remove white pith from the peel and seeds from pulp. Put berries, orange peel and pulp through the food grinder using medium knife. Place in a sterilized jar and pour the honey over the fruit. Stir to blend. Let stand 24 hours before using. This will permit the relish to jell. Note: This relish may be varied by adding a chopped apple or a small can of grated pineapple, from which the juice has been well drained.

Raw Cranberry Relish

2 cups cranberries
1 large orange
¾ cup sugar

Wash cranberries; grind in the food chopper, using the fine knife. Grate the yellow portion of the rind from the orange peel; grind the orange in the food chopper. Mix the ground cranberries and orange pulp with the grated orange rind and sugar in a bowl or refrigerator dish. Cover and store in a cold place for several hours; the relish improves on standing.

Cranberry-Tangerine Sauce

2 cups sugar
1 cup water
4 tangerines
4 cups cranberries

Wash cranberries. Combine the water and sugar and boil for 5 minutes. Add the cranberries and cook gently for 5 minutes, or until all skins pop open. Peel, section, and remove the seeds from the tangerines. Add them to the sauce. Cool.

Cranberry Sauce

2 cups cranberries
½ to ¾ cup apple juice
1 cup sugar

Inspect the cranberries; wash the perfect fruit. Place the berries, sugar, and apple juice in a deep saucepan. Cover and cook until the skins burst, or about 10 minutes. Skin off the foam which collects on the top. Cool thoroughly before serving.

Currant Sauce

Currant jelly

½ orange, grated rind ½ lemon, grated rind

Break the jelly into pieces and with a fork, mix in grated orange and lemon peel.

Tomato Juice

Tomatoes juice of lemons

Select fine red firm tomatoes, preferably of the same size. Clean, cut into pieces and cook until soft. Add as little water as possible. Press mixture through a sieve. Add the juice of 2 lemons for every quart of tomato juice. In processing, it is better to use a pressure cooker. The lack of salt for the Ricer's tomato juice requires more care in the canning. This should be served chilled.

Salad Dressing

1 onion 1 tomato

2 tablespoons mineral or Wesson oil 1 tablespoon vinegar

Slice onion and cut tomato in pieces, put in Waring Blender with oil and vinegar for 4 minutes. Makes 4 ounces dressing which keeps well in refrigerator.

Simple Honey Dressing

A delightful and easy way to use honey is in salads and salad dressings. Honey brings to these wholesome combinations its own inimitable flavor. Especially in fruit salads are the natural flavors of fruit and honey compatible.

½ cup honey

¼ cup lemon juice 3 tablespoons pineapple

Stir lemon juice and honey together, add crushed pineapple. Delicious with crisp head lettuce or plain banana salad.

French Lemon Dressing

2 tablespoons sugar
½ cup lemon juice
½ cup Wesson or mineral oil
1 clove garlic

Crush clove of garlic; add sugar, oil and lemon juice; blend in Waring Blender 1 minute.

JELLIES

Apple Jelly

Use tart apples, and not too ripe. Wash, core and remove seeds and stems. Cover with cold water, bring to a boil and cook until tender. Drain in a thick jelly bag. Measure, using a cup of juice to a cup of sugar. Bring juice to hard boil, add sugar and boil rapidly until it flakes. (To test, dip wooden paddle or silver spoon in juice, hold up to cool and flake off; when two drops of juice flake off together the jelly is ready to pour). Pour into glasses and when cool cover top with paraffin.

Peelings and cores will make jelly. Use above method.

Crab Apple Jelly

Wash and core crab apples, put into a preserving kettle and add cold water until it can be seen just below the top layer of the apples. Cook for twenty minutes. Drain in a jelly bag for three hours. To each pint of juice add one-half pound of sugar. Heat sugar in a flat dish in the oven. Bring the juice to the boiling point and boil briskly for ten minutes; add the hot sugar and boil for two minutes. Pour into glasses and cover with paraffin. Crab apple juice, added to plum, barberry, quince or peach juice, makes delicious jelly.

Apple and Barberry Jelly

Equal parts of barberry and apple juice; let boil for twenty minutes and add an equal amount of sugar. Let boil briskly until it jellies on a spoon. Quince, grape or wild plum may be used instead of the barberry juice.

Evaporated Apple Jelly

Boil evaporated apples until soft, strain juice through a jelly

bag, add one-half cup of sugar to each cup of juice and boil until it will jelly on a cold plate. A rose geranium or lemon verbena leaf adds flavor to the jelly.

Apple and Mountain Ash Jelly

Take equal parts of quartered apples and the berries of the mountain ash. Boil until soft. Drain and add one pound of sugar to each pint of juice. Boil until it jellies. Turn into tumblers and cover with paraffin.

Apple and Rhubarb Jelly

Cut apples into quarters. To every pound of apples add one cup of rhubarb juice. Let simmer until apples are soft. Strain through a jelly bag without pressure. To each pint of juice add one pound of sugar. Boil briskly, stirring well and removing all scum until of the desired consistency. Pour into tumblers and cover with paraffin.

Apple Mint Jelly

Wash, quarter and core either crab apples or sour apples. Add water, but not enough to cover. Simmer, stirring occasionally until soft. Drain in a bag and measure juice. To each cup of juice take three-fourths of a cup of sugar; heat the sugar in the oven. Heat the apple juice to the boiling point quickly and let boil for ten or fifteen minutes, skimming as needed, and add the hot sugar; let boil again, and when a little jellies on a cold saucer, add several sprigs of spearmint and enough green vegetable coloring matter to make a delicate green. Strain into glasses, half filling them; when this becomes firm, add more jelly made without the mint and coloring matter.

Spiced Apple Jelly

Wash and quarter apples. Cover with three quarts of cold water and one quart of vinegar. Boil until soft. Drain through a colander. Strain juice through a jelly bag. Take equal measures of sugar and juice, two dozen whole cloves and some stick cinnamon. Boil until it jells; strain out the spices. Pour into tumblers and cover with paraffin.

Blackberry Jelly

Use berries which are not too ripe. Pour over them enough boiling water to cover well, and cook until done. Pour into a thick cloth bag and let drip for several hours. Put on stove and reduce to half the quantity. Use one cup of sugar for one cup of juice. Heat the sugar before adding to hot juice; boil for about five minutes or until it jells, when tested with a spoon.

Remove any scum from the top while cooking. Have the glasses ready and hot to fill with the hot jelly. When cold and firm, cover with melted paraffin.

Clear Cranberry Jelly

For every pound of berries, use one and one-half cups of sugar and one pint of water.

Wash and drain cranberries, removing any faulty ones. Put water and berries together. Cook until done (about fifteen minutes). Strain through cheesecloth. Add sugar, boil quickly until it flakes, the same as making any jelly. Put into molds or jelly glasses. When firm, cover with paraffin.

Mint Jelly

Pare and core half a peck of apples, put into preserving kettle and cover with cold water. Cut a lemon into small pieces and add to apples. Cook slowly until soft. Turn into jelly bag and drain overnight. In the morning re-empty juice into the kettle, add four or five stalks of mint and simmer for twenty minutes. Take out mint, measure juice, and to one quart juice add three pints sugar. Boil until it thickens, skimming, and add one tablespoon vinegar. Just before taking from fire add a little green vegetable coloring, enough to make the desired shade of green.

Grape Jelly

An acid grape is best for this jelly. The sweet, ripe grapes contain too much sugar. Half-ripe fruit, or equal portions of nearly ripe and green grapes, will also be found satisfactory. Wild grapes make delicious jelly.

Grapes should be picked over, washed and stems removed

before putting into preserving kettle. Heat to the boiling point and cook until the seeds are free, about 30 minutes. Pour into jelly bag to drip. Take equal measures of sugar and juice and boil until it jells. Skim and pour into sterilized glasses. Keep in cool, dry place.

Quincy Jelly

Rub the quinces with a coarse crash towel; cut out the blossom end. Wash the fruit, pare it and cut in quarters. Cut out the cores, putting them in a dish by themselves. Have a large bowl half full of water; drop the perfect pieces of fruit into this bowl. Put in the parings and imperfect parts cut very fine into the preserving kettle. Add a quart of water to every two quarts of fruit and parings. Put on the fire and cook gently for two hours. Pour into glasses and when cool, cover with paraffin.

Plum Jelly

Use an under ripe acid plum. Put into the preserving kettle with a quart of water to each peck of fruit. Cook gently until the plums are boiled to pieces. Strain the juice and proceed the same as for the other jellies.

FRUITS

Baked Apples

Apples sugar apple or cherry juice

Core apples. Fill with white sugar (and raisins, if desired). Add ½ cup of apple juice or cherry juice for every 2 apples. Bake for 40 minutes in moderate oven.

Stuffed Baked Apples

3 large apples, tart
½ cup cranberries, chopped
⅓ cup bananas, mashed
½ cup sugar

Core apples and remove part of pulp, leaving the walls as a container about ¾ inch thick. Mix bananas, cranberries and sugar. Fill the cavities of the apples with the mixture. Bake in an oven 350° until tender.

Steamed Apples

Peel, core and quarter the number of apples desired. Place in strainer of double boiler over ½ inch water in bottom of pan. Boil, keeping lid on tightly for 15 minutes.

Glazed Apples

The glazed baked apples featured by restaurants are prepared as for baking except that a wide band of skin is pared from the top. The apples are arranged in a covered shallow pan and cooked slowly on top of the stove until tender. The pared surface is sprinkled with sugar or spread with syrup and the apples placed under the broiler for a few minutes until the sugar melts to form a glaze.

Washington Quartered Apples

6 apples, tart
3 tablespoons mineral oil
4 tablespoons sugar
1 cup cherry juice

Pare, quarter and core the apples, and place on an earthenware pie-plate. Boil cherry juice. Mix the sugar, mineral oil and boiling cherry juice and boil for 5 minutes. Pour this sauce over the apples, place in a moderate oven 350° and bake until the apples are soft. Baste occasionally with the hot syrup. This makes a delicious dessert.

Maple Apples*

6 tart apples
1 cup maple syrup
1½ cups water

Pare and core the apples. Heat the syrup and water to boiling; then drop in the whole apples. Cook slowly, but turn frequently to insure even cooking. When the apples are soft remove from the sauce pan and allow the liquid to cook down until thick; then pour over apples.

Apples and Cranberries

1 pint cranberries
1 cup sugar
4 or 5 apples
¾ pint apple juice

Cook cranberries in the apple juice until cranberries are done; put through strainer; add 1 cup of sugar to berries; pare, core and quarter apples; put apples into berries and cook till apples are tender but not cooked to pieces; pour into dish and serve as any fruit or jelly.

Honeyed Apples and Cranberries

6 apples, medium-sized
2¼ cups cranberries
½ cup honey
1¾ cups water

Pare and core apples and place in flat-bottomed pan. Add cranberries and water and simmer 5 minutes, turning apples once during cooking period. Add honey. Simmer 15 to 20 minutes

* See maple syrup, page 42.

longer, or until apples are tender. (Turn apples carefully during cooking so they are evenly red.) Remove apples to dish in which they are to be served, skim the cranberry sauce, and pour around apples. Cool. Cover tightly and store in refrigerator until ready to use. Approximate yield: 8-10 portions.

Jellied Apples

8 apples
1 lemon, grated rind
1 tablespoon Sherry wine
1 orange, juice
1½ cups sugar
1½ cups water
red jelly

Pare and core 8 red apples. Heat in porcelain kettle 1½ cups of water, the juice of 1 orange, the grated rind of 1 lemon, and 1½ cups sugar. Add apples and cook slowly until very tender; then remove carefully to a glass dish and fill cavities with red jelly. Let syrup simmer slowly until it thickens, add 1 tablespoon Sherry wine if permitted, and pour over apples.

Rice Crown with Apricots

Rice
fresh apricots

Cook rice and put in a mineral-oiled ring mold. When cooked, turn into a fruit dish. Cook fresh apricots and place halves around the top of the crown. Strain the remainder of the fruit through a fine sieve and pour in the hollow of the crown. If this dish is desired hot, put the mold in the oven for a few minutes before trimming it with the apricots.

Bananas Baked in Cranberry Juice

1 pint of cranberries
6 ripe bananas
1 lemon, juice
1 to 1½ cups sugar
1 cup water

Wash the berries and cover them with 1 cup water. Cook quickly 10 minutes and press through a sieve. Halve the bananas lengthwise, and squeeze the lemon juice over them. Add the sugar to the hot cranberry juice, stir well and pour over the bananas. Place in a hot oven and bake until the bananas are tender. Re-

move to a serving dish and cool well. Usually the juice of the berries will become a rich jelly during the cooling process.

Fruit Salpicon

4 bananas
1 cup pineapple, grated
1 lemon, juice
1 orange
1 cup sugar
grapes

Cut the bananas in thin slices. Peel the orange and cut in lengthwise slices. Cut the grapes in halves. Mix the fruit lightly with the sugar and lemon juice. During fresh fruit season, use 2 cups of strawberries or 1 cup of raspberries instead of orange or grapes.

Banana Mousse

1 cup cooked rice
2 tablespoons apricot juice
1 teaspoon lemon juice
1 banana, small ripe

Put in Waring Blender and mix for 2½ minutes. Put in individual pyrex dishes and place in refrigerator.

Baked Bananas

Bananas
sugar
lemon juice
Wesson oil

Remove the skins from slightly unripe bananas; slice in half lengthwise or leave whole. Put the bananas in a baking dish (preferably glass) greased with Wesson oil. Sprinkle with lemon juice, sugar, and Wesson oil, allowing about 1 teaspoon of each for each banana. Bake in a moderate oven, 350°F., for about 20 minutes or until the fruit is slightly translucent. Bananas may also be baked in their skins, then peeled and flavored just before serving.

Fried Bananas

Bananas mineral oil powdered sugar

Slice banana crosswise into ¼ inch sections. Drop in hot mineral oil and fry slowly. Too hot a pan will burn fruit. Serve hot with powdered sugar.

Cantaloupes

Secure thoroughly ripened fruit and chill. Wash; use a longbladed knife to cut into halves (or segments) for serving; remove seeds. If portions of cut melon are stored for even half an hour in the refrigerator, they should be wrapped securely in waxed paper so that their flavor will not permeate other foods.

Cantaloupe Balls

With a vegetable French baller make balls the size of a marble from the cantaloupes. Serve in small glass dish placed in crushed ice. (Glass fruit sets are made for this purpose). These balls may be served plain, or with lemon juice. Combined with watermelon balls, it makes an attractive dish.

Cranberries

Cooking cranberries too long spoils the flavor, toughens the skins. Merely to break the skins by cooking is enough. When they break they pop—after about 5 minutes of boiling. When they stop popping, stop cooking—remove from the fire, and do not disturb until cool. Always cook and keep cranberry sauce in earthen, porcelain-lined, aluminum, glass or enameled vessels; never in tin.

Cranberry Sauce

½ pound cranberries
sugar

Wash and clean ½ pound cranberries. Boil in enough water to cover berries until skins break and berries are soft. Pass through strainer. Add sugar to taste.

Candied Cranberries

2 cups sugar
3 teaspoons lemon juice
½ pound cranberries
1 cup water

Take 2 cups of granulated sugar and 1 cup of water and boil. Drop in ½ pound culled and cleaned cranberries and 3 teaspoons of lemon juice. Cook slowly until fruit is glazed.

Cranberry Mold

4 cups cranberries
2 cups sugar
1 cup boiling water

Place berries in enamel saucepan with 1 cup boiling water and simmer gently for 15 to 20 minutes, stirring frequently to prevent sticking. When berries are reduced to a soft pulp, strain through as fine a sieve as possible. Add 2 cups sugar and return to saucepan. Stir, then boil rapidly for from 5 to 8 minutes, until a spoon of the mass jells as it drops away from the spoon. Turn at once into a wetted glass or crockery mold. Chill.

Fresh Fruit Cup

No. 1

½ pineapple
1 cup strawberries
3 bananas, ripe
3 oranges
2 tablespoons lemon juice
sugar, to taste

Peel and dice the pineapple, bananas and oranges. Wash and hull the strawberries. Mix all together, with the lemon juice and sugar, and set in the refrigerator until very cold.

No. 2

3 oranges
1 cup pineapple, diced
3 bananas, ripe
1 cup apple juice
sugar, to taste

With a sharp knife cut the orange and pineapple into thick slices, then cut them into bits free from seeds and membrane. Slice the bananas thin. Arrange alternate layers of the different fruits in a deep dish and sprinkle each layer with sugar and apple juice. Over the whole pour any fruit juice. Serve very cold.

No. 3

1 cup white grapes
1 cup pineapple, diced
½ cup pineapple syrup
1 cup orange sections
½ cup orange juice
sugar, to taste

Remove skins and seeds from white grapes, and membrane from orange sections. Mix fruit, orange juice and pineapple syrup or

fresh pineapple juice, sugar to sweeten. Put in freezer, pack in ice and stir occasionally until juice begins to freeze.

South Sea Island Fruit Cup

3 bananas crushed pineapple cherries

Remove the skins from 3 bananas, cut in quarters lengthwise and slice in quarter inch slices. Arrange in cocktail or sherbet glasses. Pour ice cold crushed or grated pineapple over each allowing about ¼ cup to each serving. Garnish with candied cherries and serve immediately.

Cantaloupe Fruit Cup

Cantaloupes pineapple, crushed

Cut small cantaloupes in halves crosswise and discard seeds. Scoop out the pulp, cutting it in small pieces, and mix with an equal quantity of crushed or grated pineapple. Chill thoroughly and refill the cantaloupe shells with the mixture.

Hawaiian Grapefruit Cup

Grapefruit

powdered sugar pineapple, crushed

Cut grapefruit in halves crosswise. Remove the center membrane and loosen the sections with a sharp knife. Sprinkle the grapefruit with powdered sugar and fill the center with crushed or grated pineapple. Chill before serving.

Pineapple-Strawberry Cup

Strawberries

powdered sugar pineapple, crushed

Cut large fresh hulled strawberries in halves, reserving enough whole ones to use as a garnish. Put the cut berries in cocktail glasses and sprinkle with powdered sugar. Add crushed or grated pineapple to fill the glasses and on top of each place a whole berry. Chill thoroughly before serving.

Macedoine of Fruit

3 peaches
3 pears
½ cup pineapple, diced
½ cup watermelon, diced
1 cup raspberries
⅓ cup sugar

Pare and slice peaches and pears, cut pineapple and melon in small pieces, mix fruit and sugar, and chill for 1 hour. Serve in glasses, adding a berry or piece of pineapple in center to give color to the dish.

Broiled Grapefruit

Grapefruit
sugar

Cut grapefruit in halves crosswise; sprinkle 1 teaspoon sugar over each half. Place the halves in a pan; set the pan under the preheated broiling unit. Cook for about 15 minutes; the sugar should melt, the edge of the skin just begin to brown, and the grapefruit should be warm to the bottom.

Broiled Grapefruit with Honey

Grapefruit
honey

Wash and dry the grapefruit and cut in half crosswise. With a sharp knife cut around and under the entire pulp being careful to leave all the membrane in the shell. Cut down on each side of each section loosening each section completely. Now lift out the center core, to which will be attached the radiating membranes. This leaves the shell containing only the nicely separated fruit sections. Spread the top of each half with honey. Place under the broiler flame or in a moderate oven until the honey begins to caramelize and the ingredients are well blended. Serve hot as dessert or a first course.

Baked Peach

Canned peaches, large halves
1 teaspoon sugar
apple juice
rice paste

Use individual pyrex dishes. Place ½ canned peach in each dish, and pour over it the mixture of rice paste, which was previously thinned with 1 teaspoonful of sugar and apple juice. Bake at 350° for 20 minutes.

Stewed Rhubarb

Rhubarb sugar

Tender, pink stalks (strawberry rhubarb) are most satisfactory for stewing. Wash; remove base of stalks and leaves; place stalks on wooden board and cut without peeling into ½ inch lengths. (Old rhubarb should be peeled before cutting). Place in a saucepan, add ½ to ⅔ cup of sugar for each pound of rhubarb or for every 2 cups of ½ inch cubes. Cover saucepan; heat very slowly until juice is extracted; uncover and cook more rapidly until tender, or about 30 minutes in all. Add more sugar if necessary.

Rhubarb Royal

2 cups rhubarb, diced
1 orange, sliced
½ cup sugar
¼ teaspoon grated orange rind

Place orange slices in 1 quart casserole. Combine sugar and orange rind and sprinkle over slices. Add rhubarb and mix well. Bake uncovered in hot oven, 400°F., about 30 minutes or until rhubarb is tender. May be served hot or cold.

Glazed Strawberry Tart

1 quart strawberries
½ cup confectioners sugar
½ to ¾ cup granulated sugar
1 tablespoon rice flour
1 cup apple juice
8 baked tart shells

Wash and stem berries, mix 3 cups of berries with confectioners sugar and let stand at least 1 hour. Cook remaining cup of berries with apple juice until tender and rub through a sieve. Mix granulated sugar and rice flour, add to strained strawberry juice and cook until clear. Arrange whole berries in tart shells and pour hot glaze over top. Cool.

CRYSTALLIZED FRUIT

First, the fruit to be candied should be washed, peeled, or pared if necessary, cut in clices and dropped into boiling apple juice for two or three minutes. Drain well, cover with a syrup made by boiling together one pound of sugar and one cup of apple juice for each pound of fruit. Add fruit, boil rapidly for fifteen minutes, remove from the fire and allow to stand overnight. Next morning boil again for ten or fifteen minutes, repeating the heating and cooling for four to six days. The time depends on how rapidly the apple juice is drawn out and the syrup absorbed. The fruit plumps slowly and the gradual increase in the density of the syrup caused by the many cookings insures tender fruit which is filled with the syrup. After the fruit is transparent and bright, lift from the syrup and dry in the sun or in a cool oven. Fresh trays and constant turning are necessary. Sometimes the fruit is rolled in sugar and wrapped or placed in layers on waxed paper.

Crystallized Grapefruit or Orange Peel

Cut, peel into strips and boil until tender. By changing the apple juice several times the bitter taste is removed. Make a syrup of equal weights of sugar and apple juice; boil until it spins a thread, then to this add peel equal to the amount of sugar used, boil until the peel is transparent. If the syrup becomes too thick before peel is clear add one or two tablespoons of boiling apple juice to thin the syrup and continue cooking.

When clear (transparent) lift out and drain well, then roll in granulated sugar, let dry slightly and it is ready to serve or pack.

A good test when cooking the peel is to bend one strip and place on a plate, if it stays bent, the cooking is sufficient, if it opens continue cooking.

Apple Crystals

2 cups sugar
2 apples
granulated sugar
1 cup apple juice

Peel, core, quarter, and cut 2 apples into slices about one-half inch thick; this gives rather crescent shaped slices. Put sugar and apple juice to boil. Drop one dozen pieces at a time into syrup and boil gently until clear, transparent and tender when tested with a straw. Remove and place on platter to drain and dry slightly. Repeat until all are used, not crowding the syrup. Let apples stand for 24 hours, drain again and roll in granulated sugar. Repeat the rolling three times at intervals of 24 hours.

Honey Popcorn Balls

¾ cup sugar
¾ cup honey
½ cup water
2 packages puffed rice

Cook sugar, water (stir until sugar is dissolved) to very brittle stage (300°F.). Add honey slowly stirring until blended. Cook again until thermometer registers 240°F. (about one minute). Pour over puffed rice and form into balls. Wrap in heavy waxed paper.

Rice Crunch

Parched rice
1 lemon, juice
1 teaspoon mineral oil
1 tablespoon water
1½ cups sugar

Boil water and sugar until they form a hard ball. Add juice of one lemon and continue boiling for several seconds. Add 1 teaspoonful mineral oil and whip until frothy. Add parched rice in quantity desired. Form into balls or cut into squares when partly cool.

Honeyed Fruit Strips

Peel of 3 oranges
¾ to 1 cup honey

Remove peel from 3 oranges; cut peel in strips. Cover with water and boil 30 minutes; drain; cover with fresh water; boil

until peel is tender. Drain. Add honey enough to cover, from ¾ to 1 cup. Let simmer very slowly until peel is clear (about 45 minutes). Lay on waxed paper and let stand 2 to 3 days before using.

Variations: Grapefruit peel and lemon peel may be similarly prepared.

Comb Honey

Comb honey, as its name indicates, is the honey in the comb as stored by the bees. Usually comb honey is served in its original size or cut into individual portions. This can be done by cutting the comb honey into inch squares with a knife dipped in boiling water. Chill thirty minutes before serving to prevent loss of honey from the comb.

Chunk Honey

In the southern states there is another type called chunk honey. The combs built in shallow extracting frames are cut in various sized chunks that will slip into tin pails or glass jars. The spaces between the combs and around them are filled with liquid honey.

Cut Comb Honey

More recently little chunks of sealed comb honey about four inches long and one and one-half inches in width have been wrapped in cellophane and packed in individual cartons. In the trade they are known as Cut Comb or Honey Hunks.

CANDIES

To make candy it is necessary to make use of a candy thermometer. The heat at which the sugar is cooked determines the type of candy obtained.

Thread Test for Syrup.—Drop the syrup from a spoon or fork so that it will spin a thread, and note the length of the thread.

Cold Water Test.—Drop about ½ teaspoon of syrup into ½ cup of very cold water. Shape with the fingers into balls, which will vary in hardness according to the concentration of the syrup, or note how the syrup separates into threads when it strikes the water.

Rice Confections

The base of many rice confections is parched rice. To make parched rice, use cooked mashed rice, spread on sheets of wax paper. Dry thoroughly overnight, then toast in a heavy iron skillet, taking care not to over-brown. A quicker method is to brown it under the broiler. It must be turned constantly.

Rice Panocha

Cook 3 cups of sugar and half a cup of water until the mixture spins a thread when dropped. Pour over parched rice in a pan slightly greased with mineral oil.

Taffy White Candy

1¼ cups sugar ¼ cup water
2 tablespoons vinegar

Cook quickly without stirring to form soft ball at 250°. Pour the candy on to a mineral oiled platter or marble slab; let it cook until a dent can be made in it when pressed with finger. Then gather and pull with finger tips until light and

TEMPERATURES AND TESTS FOR SYRUP AND CANDIES*

Product	Temperature† of Syrup at Sea Level (indicating concentration of sugar desired Degrees F.	Degrees C.	Stage of Concentration Desired	Behavior at Stage Desired
Syrup	230-234	110-112	Thread	The syrup spins a 2-inch thread when dropped from fork or spoon.
Fondant, Fudge, Penuchi	234-240	112-115	Brown ball	The syrup when dropped into very cold water forms a soft ball which flattens on removal.
Caramels	244-248	118-120	Firm ball	The syrup when dropped into very cold water forms a firm ball which does not flatten on removal.
Divinity, Marshmallows, Nougat, Popcorn balls, Salt-water taffy	250-265	121-130	Hard ball	The syrup when dropped into very cold water forms a ball which is hard enough to hold its shape, yet plastic.
Butterscotch, Taffies	270-290	132-143	Soft crack	The syrup when dropped into very cold water separates into threads which are hard but not brittle.
Brittle, Glacé	300-310	149-154	Hard crack	The syrup when dropped into very cold water separates into threads which are hard and brittle.
Barley sugar	320	160	Clear liquid	The sugar liquefies.
Caramel	338	170	Brown liquid	The melted sugar becomes brown.

* *Terminology Used in Food Preparation.* A. H. E. A.

† The temperature for candy syrups should be taken near the surface as the temperature near the bottom is hotter than the true boiling point of the syrup.

porous. Shape in long strip cut in 1″ pieces. Keep candy in a tightly covered tin if you wish to keep it creamy.

Fondant

2 cups sugar
¼ cup apple juice

Put into saucepan over a gentle fire and stir until the sugar is melted. Let boil moderately without stirring until it reaches 238°F. or until it spins a short thread.

Remove from fire and pour into greased platter, let stand until the hand can stand the heat when placed under the platter. When cool beat rapidly until it becomes creamy.

Then knead until smooth.

Place in a bowl, cover with a wet cloth, put into refrigerator until ready to use.

Cooked Fondant

3 cups sugar
1 cup cold water

Mix 3 cups of granulated sugar and 1 cup of cold water well. Pour into saucepan and wipe down the sides with damp cloth so no sugar sticks to the sides. Cook the syrup until a little of it, dropped in cold water, will form a soft ball (240°F.). Pour onto enameled table top or large platter. Do not scrape the pan; use only what will pour. When cool (100°F.) stir quickly with a fork or spatula, always working from the edges to the center. As it begins to cream, knead well. Cover with a damp cloth and allow to stand a few minutes. This fondant will keep almost indefinitely in cold weather in an air-tight container, and can be molded into shapes at any time.

Uncooked Fondant

2 egg-whites
3¾ cups confectioner's sugar
1 tablespoon hot water

Beat the whites of 2 eggs until they are just broken up. Then add gradually 2½ cups confectioner's sugar, working it in well. When it begins to get fairly stiff add 1 tablespoon of hot water, then 1¼ cups more sugar. When stiff enough, mold, flavor and

color as desired. This recipe makes an excellent foundation for fancy candies. (Pieces of glace fruits, pineapple, apricot, etc., make delicious centers).

Apple Taffy

1 pound sugar ½ cup juice of stewed apples
½ tablespoon vinegar

To one pound of sugar, add ½ tablespoon of vinegar and ½ cup of juice drained from stewed apples. Put the ingredients in an agate sauce pan and let boil "to the crack." Pour on a greased platter, and when cool enough to handle, pull until white and glossy.

Honey Fondant

⅔ cup honey 4 cups sugar
2 cups boiling water

Cook honey, sugar and water slowly. Do not let it boil until sugar is dissolved. Keep crystals off sides of the pan with wet cloth dipped in cold water and wrapped around a fork. When sugar is dissolved bring to a boil slowly—to the soft ball stage, 258°F. (Keeping a cover on the pan part of the time helps to keep the crystals from forming). Remove from fire and pour at once on large greased platters. When lukewarm, stir until creamy. Then knead until smooth. Fondant improves if allowed to stand a few days before using. Flavor as desired, with mint, wintergreen, cinnamon, vanilla or other flavoring.

Honey Taffy

2 cups honey 2 cups sugar
⅔ cup cold water

Boil sugar, honey and water to hard ball stage (288°F.). Put in dish, greased with mineral oil to cool; then pull until white.

Peppermint Waffles

3 cups sugar
8 drops oil of peppermint
1 cup water

Boil ten minutes and blot until creamy. Drop on oiled paper. For lemon waffles, substitute lemon peel instead of peppermint.

Divinity

3 cups sugar
½ cup water
2 egg-whites
1 teaspoon vanilla

Mix sugar and water together and boil until first indication of soft thread appears, 234°F. (Soft ball). Beat the mixture into the stiffly beaten egg whites. Add vanilla. (Coloring may be added at this stage if desired). Beat until the mixture will hold its shape, and drop on waxed paper, or when first indication of thread appears.

MARMALADES

Marmalades are usually made from citrous fruits, oranges being the most common, but other fruits may also be used.

Apple Marmalade

Apples, coarse grained lemon rind sugar

Pare, core and cut into small pieces coarse grained apples. Allow a pound of sugar to each pound of apples. Add enough water to dissolve the sugar and boil until thick; add the apples and boil until tender; pass through colander; add the juice and grate rind of a lemon to every four pounds of fruit. Boil again until thick and put up in jars or glasses. Cover with paraffin. Crab apple marmalade may be made in the same way with the lemon omitted. When cold it should cut like cream cheese.

Banana Marmalade

2 pounds of bananas

2 pounds sugar 1 lemon, juice

Peel and slice bananas, add sugar and lemon juice. Put in earthenware or copper vessel for an hour. Turn into a preserving pan and bring gently to the boil, stirring constantly, as it soon thickens. Test by dropping a little on a plate. If it sets, quickly remove from the fire at once and place in jars.

Carrot and Orange Marmalade

12 carrots 2 lemons
6 oranges sugar

Remove peel from oranges and lemons and soak the peel overnight in cold water to cover. After soaking remove peel from

water and chop. Discard the water. Cut oranges and lemons in small pieces. Dice carrots and cook until tender, using as little water as possible. Combine carrots, fruit and grated peel, measure and add two-thirds as much sugar as mixture. Simmer until clear. Pack while hot into clean, hot jars and seal at once.

Cherry and Pineapple Marmalade

Pineapple cherries sugar

Wash, drain, seed the cherries and run them through a meat grinder. Peel and grind or shred the pineapple. Mix pineapple with cherries using ¼ as much pineapple as cherries. To the mixture add 2/3 as much sugar as there is fruit and juice. Cook this mixture until it is clear and thick, stirring to prevent burning. Pour hot marmalade into clean, hot jars. Seal immediately.

Fig Marmalade

Figs sugar

This can be made from the bruised and soft figs, by mashing the fruit well. Place figs in a little water, bring to a boil, measure fruit, add same amount of sugar as fruit and cook for 1 hour, stirring to prevent burning. Pack hot marmalade into clean, hot jars and seal immediately.

Gooseberry and Rhubarb Marmalade

Rhubarb gooseberries sugar

Stem, wash and mash gooseberries. Add any proportion of young rhubarb, cut into pieces, desired. Place mixture into preserving kettle containing just enough water to cover bottom of kettle. Let fruit simmer until soft. Measure mixture and add ¾ as much sugar as mixture. Boil until mixture is thick (about 20 minutes), stirring to prevent burning. Pack hot marmalade into clean, hot jars. Seal immediately.

Grape Marmalade

Grapes sugar

Wash grapes and remove stems. Press pulp from the skins. Cook pulp and press through a sieve to remove seeds. Add the skins to pulp, measure mixture and allow 2/3 as much sugar as pulp. Cook mixture until skins are tender (about 20 minutes), and seal at once in clean hot jars.

Guava Marmalade

Sugar guavas lemon juice

Use well ripened or over-ripe guavas. Slice. Place with a little cold water in a kettle. Cook until soft, and press through a coarse sieve. Measure pulp and add ¾ as much sugar as pulp. Add juice of 1 lemon to each pint of pulp. Cook mixture until thick. Pack hot marmalade into clean, hot jars. Seal immediately.

Orange Marmalade I

6 oranges
7 cups sugar
1 lemon
11 cups cold water

Peel oranges, removing all white skin, and slice thin. Slice lemon with rind on; cover oranges and lemon with cold water; let stand 24 hours. Then boil 3 hours; add sugar, and let boil 1 hour. Pour into glasses; cool, and cover. This recipe makes 9 glasses of marmalade.

Orange Marmalade II

9 oranges
sugar
6 lemons
2 quarts water

Remove peel from the fruit in quarters. Cut in thin strips with a sharp knife or scissors. Slice fruit as thin as possible, remove seeds and place fruit in a preserving kettle with the water. Cover and let stand for 36 hours. Boil slowly for 2 hours, measure the cooked fruit and add an equal amount of sugar, cook to jelly stage. Seal when cold.

Orange and Lemon Marmalade

3 oranges
2 lemons
5 cups sugar
5 cups water

Wipe fruit, and cut, crosswise, in as thin slices as possible, removing seeds. Put into preserving kettle, add water, and let stand 36 hours. Place on range, bring to boiling point, and let boil (not simmer) 2 hours. Add sugar, and boil 1 hour. Turn into sterile glasses, let stand until firm, and cover with melted paraffin.

Quince Marmalade

Quinces
sugar

Cut and quarter unpeeled quinces. Put in kettle and just cover with water. Let cook until tender. Press through a sieve, measure and add ¾ as much sugar as pulp. Cook this slowly until quite stiff, stirring frequently to avoid burning. Pack into clean, hot jars. Seal immediately.

Pineapple Marmalade

2 cups pineapple, crushed or grated
3 oranges
1 lemon
2 cups sugar
5 cups water

Wash 3 oranges and 1 lemon and slice very thin, add 2 cups crushed or grated pineapple and 5 cups water, cover and allow to stand over night. Cook for 2 hours. Add 2 cups sugar and cook very slowly 1 hour longer. The slow cooking will give the marmalade a rich amber color. Pour into sterilized glasses and seal with paraffin.

Black or Red Raspberry Marmalade

Berries
sugar

Wash and drain berries, mash thoroughly, place them in a preserving kettle with as little water as possible and bring quickly to boil. Press mixture through a fine-mesh sieve to remove seeds. Measure mixture and add ¾ as much sugar as there is pulp and juice. Boil gently for 10 minutes. Pour hot marmalade into clean, hot jars. Seal immediately.

Raspberry and Currant Marmalade

4 quarts red raspberries
1 quart red currants
sugar

Wash berries and currants and place in a preserving kettle. Mash fruit thoroughly, add ¾ as much sugar as fruit and boil mixture for 10 minutes or until it jells when cooled. Stir constantly to prevent burning. Pack hot marmalade into clean, hot jars. Seal immediately.

Rhubarb Marmalade

Rhubarb
sugar

Cut young stalks of rhubarb into 1-inch lengths. Do not peel. Weigh rhubarb and add ¾ pound sugar to each pound rhubarb. Place rhubarb and sugar in a preserving kettle, heat slowly and boil mixtuure until thick and clear. Pack into clean, hot jars. Seal immediately.

Rhubarb and Pineapple Marmalade

3 pints strawberry rhubarb
2 lemons, juice and grated rind
4 cups sugar
1 cup pineapple, diced

Combine ingredients and boil mixture until it is thick and clear. Pack into hot jars and seal immediately.

Tomato Marmalade

2 quarts ripe tomatoes
1 cup vinegar
⅔ cup sugar
2 teaspoons mixed spices

Combine ingredients. Cook mixture slowly until it is thick, stirring to prevent burning. Pack into clean, hot jars. Seal immediately.

Three Fruit Marmalade

1 grapefruit
3 oranges
2 lemons
sugar

Scrub and dry fruit. Remove seeds and as much of the tough fibre as possible. Slice very thin, then proceed exactly as in ordinary orange marmalade.

JAMS

A jam is a variation of a preserve. The product is cooked to a thick mass and the proportion of sugar used is less than the amount used for preserves. For jam use ½ to ¾ pound sugar to 1 pound fruit. Jams need constant stirring to prevent burning.

Apple Jam

Apples
sugar — **rind and juice of lemon**
ginger root — **cloves**

Pare and cut apples into quarters, core and cut into rather thick slices; to every pound of apples allow 1 pound of sugar, and to every 5 pounds of apples allow the thinly cut rinds and juice of 4 lemons and ½ pound of ginger root and 1 ounce of cloves. Let stand in a bowl until the following day; boil until the apples are a rich amber color and perfectly clear.

Blueberry and Crab-Apple Jam

Blueberries — **crab-apples** — **sugar**

Equal measures of canned blueberries and crab-apples may be used, or 1/3 as much berries as crab-apples. Remove cores from crab-apples, but do not pare them. Grind in food chopper. Add just enough water to cover apples, and cook for 10 minutes. Add blueberries and sugar, using 2/3 as much sugar as fruit, by measure. Cook mixture until thick, and pack immediately into clean, hot jars and seal at once.

Kumquat Jam

Kumquats — **sugar** — **lemon juice**

Slice Kumquats. Cook until tender in just enough water to keep

from burning. Measure and add equal parts of sugar with a little lemon juice. Cook mixture until thick, stirring to prevent burning. Pack hot jam into clean, hot jars. Seal immediately.

Peach Jam

3 pints peach pulp
1½ inches ginger root
¾ teaspoon allspice
3 teaspoons cinnamon bark
4 cups sugar
3 peach pits
1½ teaspoons cloves
¾ cup peach juice or water

Blanch peaches in boiling water, cold-dip and remove skins and pits. Mash pulp. Add sugar, also spices (tied in a bag). Cook until mixture is thick and clear. Remove spice bag. Pack into clean, hot jars and seal immediately. *Note*: Spices may be omitted.

Apple pulp may be substituted for part of peach pulp.

Instead of spices, juice of a lemon and 12 peach pits may be added.

Plum Jam

3 pints plums
4 cups sugar

Damson plums make the best jam. Wash plums and remove pits, if desired. The flavor of the pits is sometimes preferred. Add sugar, and cook until mixture is thick and clear (about 218°F.). Pack immediately into hot, clean jars and seal at once.

Elderberry Jam

1 quart elderberries
5 cups sugar
12 cooking apples
1 lemon
3 oranges

Cook apples until mushy. Add elderberries, oranges and lemon chopped fine. Grate the rind of one orange and the lemon rind. Mix together with sugar and boil 30 minutes.

Raspberry, Strawberry, or Blackberry Jam

4 pounds berries

2½ pounds sugar

Mash berries, add sugar; cook 30 minutes, stirring very often. Pour into hot glasses and cover.

Red Raspberry and Currant Jam

4 pounds currants

6 pounds sugar

4 pounds raspberries

Remove stems from currants, mash, cook 30 minutes; add raspberries and sugar, bring to boiling point. Fill jars half full of the fruit, then boil juice to consistency of molasses. Fill jars to the brim and seal.

Strawberry-Pineapple Jam

4 cups strawberries

3 cups sugar

8 cups pineapple

Wash and hull fresh strawberries to measure 4 cups, add 3 cups sugar and mash to start the juice flowing. Cook slowly over a low heat for 30 minutes, stirring often. Add 8 cups crushed pineapple and cook until thick. Pour into sterilized glasses and seal with paraffin.

Rhubarb Jam

Rhubarb

Sugar

Wash, dry and cut the desired quantity of rhubarb; use equal weight of sugar. Mix and let stand overnight. There will be sufficient juice to cook. Bring to boil and let boil hard for ½ hour; stir as little as possible; simmer until clear and thick. Lemon or orange rind and juice may be added, if desired.

CONSERVES

A conserve is a mixture of several fruits and is made like jam.

Blueberry and Apple Conserve

1 quart blueberries
1 quart tart apples, diced
2 lemons, juice
6 cups sugar
1 lemon, grated rind

Fresh or canned blueberries may be used. Combine ingredients and cook mixture until thick and clear, stirring to prevent burning. Pour immediately into clean, hot jars and seal at once.

Carrot, Apple and Peach Conserve

1 quart carrots, diced
1 quart tart apples, diced
6 cups sugar
2 cups peaches
2 lemons, juice

Mix ingredients and simmer until mixture is clear, stirring to prevent burning. Pack hot into clean, hot jars and seal at once.

Damson Conserve

7 pounds damsons
5 pounds sugar
2 oranges, juice, pulp, and rind

Wash and pick over damsons, remove stems. Add just enough water to sugar to make a syrup. Remove seeds from oranges and grind the rind. Mix all together and cook slowly, stirring often to prevent scorching. Cook until thick as jam (about one hour), put into fruit jars and seal.

Peach Conserve

3 lemons, juice and grated rind
3 pints peach pulp — 4½ cups sugar

Blanch peaches in boiling water, cold-dip. Remove skins and stones. Cut into thin slices. Mix ingredients and cook until thick and clear. Pack into hot jars. Seal immediately.

Pineapple and Apple Conserve

1 quart pineapple, diced or shredded
1 quart tart apple, diced — 2 oranges, juice and grated rind
6 cups sugar — 1⅓ cups shredded cocoanut

Cook the pineapple in water until tender. Add the apple, orange juice and rind, and the sugar. Cook mixture until it is clear and transparent. Add cocoanut and pack conserve into clean, hot jars. Seal at once.

Black or Red Raspberry and Cherry Conserve

2 cups cherries, pitted
2 cups raspberry pulp — 4 cups sugar

Cook cherries in a small amount of water until skins are tender. Add raspberyy pulp and sugar, and cook mixture until it is thick and clear. Pour into hot jars and seal at once.

Strawberry and Rhubarb Conserve

2 quarts strawberries
2 quarts rhubarb — 12 cups sugar

Cut rhubarb into ½-inch pieces, being careful not to peel. Mix together strawberries, rhubarb and sugar, and cook mixture slowly until it is thick and clear. Pour into hot jars and seal at once.

PRESERVES

Preserves are fruits which have been cooked long enough in a heavy sugar syrup so that most all the water in the fruit has been supplanted with syrup. For the Ricer, preserves should be made with raw fruit, sugar and water. No preservatives may be added. They should be home made to ensure their purity. The danger of store-bought preserves lies in the addition of certain chemicals put in by some manufacturers to cut down on the more costly product, sugar. Preserves are relatively easy to make. The seasons should be watched and the preserves made when the fruit is most easily obtainable on the market so that Ricers may have pure home-made preserves on hand.

Apple Preserves—I

Sugar
ginger root
apples
lemon juice

Use three-quarters of a pound of sugar to each pound of apples. Good flavored apples that are not easily broken should be used. Make a rich syrup of sugar and water and add a little ginger root tied in a bag; add a little lemon juice and boil a few apples at a time until transparent. Place in jars or glasses; boil the syrup until very thick and pour over the apples. Crab apples make delicious preserves; core without paring until clear in a rich syrup, drain and place in jars; fill with the syrup boiled down.

Apple Preserves—II

1 pound sugar
apples
1 lemon, rind and juice
½ pint water

Make a syrup of one pound of sugar and to ½ pint of water

add the thin outer rind and the juice of 1 lemon; let boil briskly for five minutes. Drop quarters of apples into the syrup and cook gently until clear; stand aside to cool. When cold, transfer carefully to jars and boil the syrup down. Pour over the apples and seal.

Apple Preserves—III

Apples
Sugar
whole cloves
ginger tea
candied lemon peel

Drop pared and quartered apples into clean lime water to prevent discoloration. When enough are ready for use, rinse in clear, cold water and pack in their own weight of sugar. Let stand 24 hours; drain syrup off and boil. For each cup of syrup, add 1 tablespoon of ginger tea. Add apples and cook until clear, skim out, lay on a platter, cover with glass and set for 6 hours in the sunshine. Return to syrup and cook for 2 minutes, skim out and pack jars. Add more sugar and cook the syrup until as thick as honey; pour over the fruit; add 2 whole cloves and a bit of candied lemon peel to each jar and cover with parraffin.

Apple Preserves—IV

Apples

Quarter and core apples; fill an earthen crock 2/3 full, cover and bake slowly for several hours. Seal in airtight jars. When ready to use, stand the jar in a kettle of water and heat; they taste like freshly baked apples.

Apple Preserves—V

Apples
sugar
lemon, grated rind

Pare and core large, firm apples. Boil the parings in water for 15 minutes, allowing a pint to each pound of parings. Strain, and add ¾ of a pound of sugar to each pint of water, as measured at first; add the grated rind of ¼ lemon to each pint of syrup and return to the kettle and let boil for 5 minutes, skim

and pour over the cold raw apples. Let stand until cold. Then cover and cook slowly until transparent. If directions are carefully followed the apples will remain unbroken.

Spiced Crab Apples

Crab apples
1½ pints vinegar
3 pounds sugar
2 ounces stick cinnamon

Select sound crab apples with the stems on. Boil 3 pounds sugar and 1½ pints vinegar to a rich syrup; add 2 ounces of stick cinnamon. Drop a few of the crab apples into the syrup, turn and cook until tender, remove and place in jars, continue until the apples are all used, boil the syrup down and pour over the fruit. If the crab apples are very ripe it is better to steam them until tender; place in jars and pour the syrup over them.

Apple and Quince Preserves

Apples
quinces
sugar

Pare, core and quarter Baldwin apples; add 1/3 as many quinces that have been pared, cored and cut into small pieces and boiled until tender. Make a syrup of the water in which the quinces were boiled and as much sugar as there are apples and quinces. Let boil, skim and drop the quinces and apples in, and let boil for 15 minutes; dip out carefully and put into jelly glasses; boil the syrup until it will jell and pour over the fruit.

Apple Ginger Preserve

4 pounds apples
⅛ pound green ginger
2 lemons
3 pounds sugar
½ pint water

Pare and slice thin 4 pounds hard apples. Cut fine the rind of 2 lemons. Parboil ⅛ pound green ginger; peel and cut fine. Put in preserving kettle with ½ pint water, 3 pounds sugar and the juice of the 2 lemons. Cook until thick. Put in jelly glasses, cool and cover with paraffin.

Apple Chips

8 pounds sweet apples
¼ pound Canton ginger
4 pounds sugar
4 lemons

Cut 8 pounds of sweet apples into small pieces. Don't pare. Add 4 pounds of sugar and ¼ of a pound of Canton ginger. Add the sugar and ginger to the apples and let stand for 24 hours; add 4 lemons cut into small pieces, rejecting seeds. Cook slowly for 3 hours. Put into glasses or stone jars and cover with paraffin.

Preserved Crab Apples

Crab apples
sugar

Cut out the blossom, but leave on the stem. Cover the bottom of an earthenware crock with water; put in a layer of apples. Cover with a thick layer of sugar. Add a layer of crab apples, and continue in this manner until the crock is full. Cover and bake for 8 or 10 hours in a very slow oven.: Cover, and when cool place in a dark, cool place. The result is a delicious, translucent apple in a red jelly.

Apricot Preserves

4 pounds apricots
6 cups sugar
2¼ cups water

Drop apricots in boiling water. Plunge in cold water. Peel and remove stones. Combine sugar and water and boil 5 minutes. Add apricots and cook until tender. Pour into sterilized jars and cover.

Cherry Preserves

Sugar
cherries
cherry juice or water

Wash, remove stems and pits from cherries. Save the juice. Place cherries in a shallow pan and cover with a medium thick syrup made with 3 parts sugar to 2 parts cherry juice or water. Boil gently for 10 minutes; remove from heat and let stand in a covered kettle from 6 to 12 hours. Drain off the juice from

cherries and pack cherries into clean, hot jars. Heat the remaining syrup and fill the jars with the boiling syrup. Seal at once.

Currant Preserves

Currants sugar

Wash and stem currants. Place in a boiling syrup using 3 parts sugar to 1 part water. Boil gently for 15 minutes and pour immediately into clean, hot jars. Seal at once.

Bar-Le-Duc Currants

Red currants strained honey

Take large red currants and one by one make a slit in sides and with a needle remove all seeds, being careful not to crush fruit. Take the weight of fruit in strained honey and, when hot, add the fruit. Let simmer five minutes. Carefully skim out the fruit, then reduce the syrup, at a gentle simmer, to the required consistency. Then store as jelly.

Citron Melon Preserves

4 pounds peeled melon
9 cups sugar
ginger root
2 lemons, juice and rind
8 cups water

Slice or cut into cubes 4 pounds of peeled melon. Soak 3 hours in 2 quarts cold water. Drain, cover with fresh water and simmer until melon becomes transparent and slightly tender. Let cool in cooking liquid. Drain. Rinse in cold water. While cooling, boil 8 cups water and 9 cups sugar until thick. Add juice and grated rind of 2 lemons. A little ginger root may be added if desired. Add melon to syrup, bring to boiling point and pack into clean, hot jars. Seal immediately.

Fig Preserves

4 pounds fresh figs
1 lemon
4 cups sugar
1 cup water

Peel fresh figs, slice lemon, combine with water and sugar and

cook 5 minutes slowly. Then increase flame and cook rapidly until clear.

Mixed Fruit Preserves

1 pint quinces
1 pint pears
3 lemons
1 pint sweet apples
1 pint peaches
6 cups sugar

Do not remove the skins of the quinces, pears, apples or peaches. Slice each separately; cook each separately; cook each separately until tender. Drain off the juice from each, and add it to the sugar. Boil the mixture until it becomes a medium thick syrup. Add all the cooked fruit, juice of 2 lemons and 1 lemon sliced thin. Cook mixture until it is thick and seal at once in hot jars.

Apple Ginger

4 pounds sour apples
4 lemons
2 pounds sugar
1 ounce white ginger root

Pare, core and chop apples; wash, remove seeds and chop lemons. Add sugar and ginger root and cook very slowly for six hours. Pour into glasses and cover.

Gooseberry Preserves

1 pound gooseberries
1¼ pounds sugar

Clean berries and wash. Half cover the gooseberries with water and scald the fruit until the skins are soft. Cook until clear. Seal in sterilized jars.

Greengage Preserves

4 pounds green gage plums
3 cups sugar

Plunge plums in hot water until skins crack. Drain and peel. Let stand overnight, after covering with sugar. Drain and boil juice. Then add plums, cooking rapidly until tender. Boil until juice thickens and jells. Place in sterilized jars.

Kumquat Preserves

Kumquats sugar

Wash kumquats. Place halved, or whole, into boiling syrup made with 3 parts sugar to 1 part water. Boil until tender. Pack into clean, hot jars. Cover with boiling syrup. Seal immediately.

Peach Preserves

4 pounds peaches
4 cups sugar 2 cups water

Put peaches in hot water until skins loosen and peel. Remove stones; add sugar and water and cook 10 minutes, then reduce heat, cook until clear. Place in sterilized jars.

Chipped Pears

4 pounds pears
4 lemons
2 pounds sugar
½ pound Canton ginger

Pare, core, and cut pears into slices. Wash lemons, removing seeds, then chop. Add ginger and sugar. Cook very slowly for four hours. Pour into glasses and seal.

Pineapple Preserves

3 pounds pineapple chunks
4½ cups sugar

If fresh pineapple is used, cut out eyes after paring. Cover with water halfway; add sugar; cook. Put fruit into syrup; add additional water and cook until clear. Place in sterilized jars.

Spiced Pineapple

1 cup vinegar
4 cups pineapple, crushed
1 cup sugar
½ teaspoon cinnamon
¾ teaspoon cloves

To 1 cup vinegar add 1 cup sugar, ½ teaspoon cinnamon, ¾ teaspoon cloves, 4 cups crushed pineapple. Cook slowly for ½ hour. Seal in hot glasses with paraffin. Excellent with cold cuts.

Pineapple-Watermelon Preserves

4 pounds sugar
4 lemons, juice and rind
4 cups pineapple, crushed
2 teaspoons ginger
4 pounds watermelon rind
4 cups water

Boil 4 pounds sugar and 4 cups water, with 2 teaspoons ginger, and juice and grated rind of 4 lemons, for 10 minutes. Add 4 pounds watermelon rind cut in small cubes. Simmer gently for 3 hours. Add 4 cups crushed pineapple and cook 45 minutes longer. Seal in jars.

Plum Preserves

6 pints plums 9 cups sugar 1 cup water

Select small purple plums; they must be sound and not over-ripe. Remove stems, wash and pierce each plum with a fork. Place plums in an earthen bowl or jar, cover with sugar and add water. Cover vessel and let stand in a cool place overnight. Drain plums and boil the juice for 5 minutes. Add plums and cook for a few minutes until clear. Care should be taken not to over-cook, as the syrup thickens or jells after standing. Pack into hot, clean jars and seal immediately.

Plum Preserves

3 pounds damson plums
4½ cups sugar ½ cup water

Pierce each plum with a fork after stemming and washing. Place in enamel kettle in layers with sugar and add water. Let stand overnight. Drain and boil juice 5 minutes. Add plums and cook until clear. Place in sterilized jars.

Pumpkin Preserves

5 pints pumpkin
8 cups sugar 3 lemons

Cut pumpkin into slices ¼ inch thick and from 1 to 2 inches long. Place in an earthen bowl or preserving kettle, add the sugar and let stand overnight. Drain and boil the liquid until

it threads. Add the pumpkin and thinly sliced lemons. Cook mixture until it is thick and clear. Seal while hot, in clean hot jars.

Quince Preserves

5 pounds quinces

Scrub quinces with a brush; pare, quarter and core them. Drop quarters into cold water to prevent discoloring. Cook parings and cores in water 15 minutes and strain liquid; boil 10 minutes. Add quinces and cook until clear. Place in sterilized jars.

Raspberry Preserves

Raspberries sugar

Mix thoroughly equal parts of raspberries and sugar. Cook slowly and stir until mixture boils. Boil gently for 6 minutes and pour into clean hot jars and seal at once.

Rhubarb Preserves

2 quarts rhubarb
6 cups sugar 2 cups water

Boil sugar and water together until the syrup becomes brittle when dropped into cold water. Cut rhubarb into small pieces and drop into the boiling syrup and cook mixture until it is thick and clear. Pour into clean, hot jars and seal at once.

Rhubarb and Fig Preserves

3½ quarts rhubarb 8 cups sugar
1 pint figs, chopped 1 lemon

Cut rhubarb into small pieces, add sugar and let mixture stand overnight. In the morning boil until thick and add 1 pint of chopped figs and the juice and rind of 1 lemon. Cook rapidly until mixture is thick and clear. Pack while hot, into clean, hot jars and seal immediately.

Tomato Preserves

5 pounds ripe tomatoes
8 cups sugar
2 lemons

Scald and peel tomatoes. Place in a crock or enameled bowl, add sugar and let stand overnight. Drain off the juice and boil it rapidly until it threads. Add the tomatoes and lemons sliced thin, and cook until the mixture is thick and clear. Pack into clean, hot jars and seal immediately. The preserves should be a rich, red color.

Yellow Tomato Preserves

2 quarts yellow tomatoes
3 cups sugar
1 lemon
4 tablespoons ginger root

Wash and dry tomatoes, cut thin slice from blossom end and press out seeds. Put tomatoes into preserving kettle, sprinkle sugar over top, simmer until sugar is dissolved, then boil slowly for 40 minutes. Wash and cut the lemon into wafer thin slices, removing seeds. Add lemon and ginger (cut in small pieces), boil 10 minutes more. Pack while boiling hot into hot jars and seal immediately.

Strawberry Preserves

3 pounds strawberries
6 cups sugar

Wash, hull and weigh strawberries. Place in large kettle in layers with sugar and heat to boiling. Stir carefully to avoid crushing. Boil rapidly until clear. Place in sterilized jars.

Strawberry Preserves—French Method

Strawberries
sugar

Wash and cap large, firm, ripe berries, washing quickly so as not to have berries watersoaked. For every pound of berries allow ¾ of a pound of sugar. Sprinkle sugar over berries and let stand for several hours until a syrup is formed. Place on fire, bring to a boil, and let boil gently for 1 minute. Remove from fire and set in cool place to stand overnight. The following day again bring to a boil and allow to boil 2 minutes. Repeat first process, letting stand overnight. The 3rd day repeat the boiling for 3 minutes. Pour into sterilized jars and seal immediately.

FROZEN DESSERTS

Frozen desserts, for summer consumption, are a general favorite, and are particularly welcomed by the Ricer who, because of the restricted fluid intake, feels the summer heat more than he would ordinarily.

Lemon Ice

¾ cup lemon juice
2 cups sugar
1 quart apple juice

Make a syrup by boiling the apple juice with the sugar for 5 minutes. Add the strained lemon juice. Cool and freeze.

Orange Ice

1 pint orange juice
2 ounces lemon juice
1 cup sugar
1 orange, grated rind

Make a syrup as for lemon ice.

Coupe Saint Jacque

Lemon ice
fresh fruits
cranberries, candied
orange peel, candied

Fill a tall champagne glass half full with finely diced fresh fruits; add lemon ice to fill glass. Ornament with candied cranberries and orange peel.

Frozen Peaches

¾ cup of syrup from sliced peaches
2 oranges, juice
¾ cup of sliced peaches
½ cup sugar
1 lemon, juice
1½ cups water

Boil together for 3 minutes ¾ cup of syrup from sliced peaches,

½ cup of sugar and 1½ cups of water. Let cool, add the juice of 2 oranges and 1 lemon, and freeze. When nearly done, add ¾ cup of the sliced peaches, pack and let stand at least 2 hours to ripen.

(*Genevieve A. Callahan*)

Pineapple Frappe I

1 cup sugar
2 cups pineapple
2 lemons, juice
4 cups water

Boil 1 cup of sugar and 2 cups of water for 5 minutes. Add juice of 2 lemons, 2 cups of water and 2 cups of pineapple. Cool, strain and freeze to a mush.

(*Sarah Tyson Rorer*)

Pineapple Frappe II

1 cup sugar
1 cup pineapple, crushed
1 cup sugar
3 tablespoons lemon juice
2 cups ice water

Mix 1 cup sugar and 2 cups water and boil for 12 minutes. Cool, add 2 cups ice water, 1 cup crushed (or grated) pineapple and 3 tablespoons lemon juice. Freeze to a mush, do not repack but serve as soon as possible.

Crushed Pineapple Freeze

1 cup sugar
1 cup preserved cherries
1 orange, juice
1 cup pineapple, crushed
2 lemons, juice
2 cups boiling water

Cook 1 cup sugar and 2 cups boiling water for 10 minutes. Cool. Add 1 cup crushed pineapple, 1 cup preserved cherries, and juice of 2 lemons and 1 orange. Freeze.

Frosted Grapes

Seedless grapes
sugar

Take seedless grapes and wash; shake off excess water; leave grapes in small bunches. Dip each bunch of grapes into Superfine sugar (not granulated or powdered). Then place in refrigerator at least 1 hour. Serve as refreshment or dessert. This gives the grapes a very attractive appearance.

Melon and Frosted Grapes

1 pound grapes, seedless
1 egg white
1 honeydew melon
sugar

Frosted green grapes on a half moon of honeydew melon will start a formal dinner delightfully. Choose firm, perfect grapes and cut off 5 or 6 (with the stem) for each individual serving. To frost the grapes, first cut a triangular piece of brown paper about 2½ inches long. Fringe on the edge, and paint the grapes with the unbeaten egg-white. Sprinkle with granulated sugar, and allow to dry. Cut chilled honeydew melon into 8 slices, lengthwise, and fill with frosted grapes.

Tested by The American Home

Cranberry Ice

1 quart cranberries
2 lemons, juice
1 pound sugar
1 pint water

Cook the cranberries with the water until the berries are tender; then strain; add the sugar and cook until this is thoroughly dissolved. Cook; stir in the strained lemon juice, and freeze to the consistency of water ice.

Pears with Orange Ice

2 cups sugar
2 cups orange juice
¼ cup lemon juice
2 oranges, grated rind
1 quart water

Boil 1 quart water with 2 cups sugar 5 minutes. Add 2 cups orange juice, grated rind from 2 oranges and ¼ cup lemon juice. Strain, cool, freeze and serve on halves of Del Monte pears.

(*Kate Brew Vaughn*)

Cardinal Ice

juice of 1 quart raspberries
juice of 1 quart mashed currants
3 cups sugar
2 cups apple juice

Mix ingredients together, heat, cool and freeze.

SHERBETS

Sherbets are made in the same way as ices, the only difference is in the addition of 2 egg whites to the above quantities. These can be made when permission to use egg-whites has been given by the physician.

Apple Sherbet

1 quart apples
1 lemon, juice
1 egg-white
1 orange, juice
½ pound sugar
1½ quarts water

Boil 1 quart of apples in a pint of water until soft. Mash through a sieve. Add the juice of 1 orange, 1 lemon, ½ pound of sugar and a quart of water. Beat well and freeze. When it becomes like slush, add the well beaten white of 1 egg and finish freezing.

Crab Apple Sherbet

2 quarts crab apples
2 cups sugar
1 lemon, juice
1 pint crab apple juice
1 quart water

Put 2 quarts of quartered crab apples over the fire with enough water to keep them from burning, cover and let simmer until tender; drain as for jelly. Boil 1 quart of water and 1 pint of sugar for 20 minutes from the time that it begins to boil. When cool, add 1 pint of the crab apple juice and the juice of 1 lemon and freeze.

Blackberry Sherbet

1 cup sugar
1 lemon, juice
2 egg-whites
2 cups blackberries and syrup
1 cup water

Boil 1 cup sugar and 1 cup water for 1 minute. Cool, add the

juice of 1 lemon and 2 cups blackberries and syrup and freeze to a mush. Stir in 2 stiffly beaten egg whites and continue freezing until firm; or pack and let stand an hour or more.

(*Winifred Stuart Gibbs*)

Pineapple Sherbet I

2 cups pineapple, crushed
½ cup lemon juice
3 cups water
2 cups sugar

Drain the syrup from 2 cups of crushed (or grated) pineapple. Add ½ cup sugar to the drained pineapple and cook slowly 30 minutes, stirring frequently. Mix 1½ cups sugar and 3 cups water. Boil 15 minutes, cool, add the syrup drained from the pineapple and ½ cup lemon juice. Freeze and when done add the cooked and cooled pineapple mixture. Beat until well mixed, pack and allow to stand at least 1 hour before serving.

(*Maria Parloa*)

Pineapple Sherbet II

1 cup sugar
1 cup pineapple juice
2 lemons, juice
1 cup apple juice
½ cup pineapple, crushed

Boil 1 cup sugar in 1 cup of pineapple juice. Cool. Add 1 cup apple juice, juice of 2 lemons and ½ cup of crushed pineapple. Place in tray and allow to quick freeze. Whip after 20 minutes to prevent crystal formation. Refreeze.

Raspberry Sherbet

1 cup sugar
2 lemons, juice
1 cup apple juice
1 cup raspberry juice

Boil 1 cup of sugar, 1 cup of raspberry juice (obtained from 1 pint of fresh or frozen raspberries). Strain out solid portion, and cool juice. Add juice of 2 lemons, cup of apple juice. Mix, place in quick freeze; stir in 20 minutes, then refreeze.

ICE CREAMS

Ice creams for patients on the rice diet are based on rice paste. This paste is made by placing well-cooked rice in the Waring Blender. The fruits are added, cup for cup, of rice paste, and the sugar necessary usually measures out 2 tablespoonsful for every cup of mixture. The consistency of the mixture should be that of a pancake batter. It can be thinned by adding fruit juice, frozen in the regular trays of the freezing compartment of the refrigerator. The fruits most suitable are apricots, bananas, raspberries and strawberries, because of their very distinct flavors.

Raspberry Ice Cream

1 pint raspberries
2 cups cooked rice
1 cup sugar

Mix all the ingredients well in a Waring Blender and blend for 10 minutes. Freeze in freezing compartment of refrigerator. Strawberries may be used instead of raspberries.

Banana Ice Cream

1 cup cooked rice
¼ cup sugar
1 banana
1 cup orange juice

Mix all the ingredients well in a Waring blender. Stir until a smooth mixture results. Put in glass tray in quick freeze. Stir several times to prevent the formation of ice crystals.

Prune Ice Cream

1 cup prune pulp
2 cupe cooked rice
1 lemon, juice
1 cup sugar
1 orange, juice

Put ingredients in a Waring Blender and blend for 20 minutes. Then freeze.

THE DIABETIC AND THE RICE DIET

While in Durham I made the acquaintance of a diabetic of many years standing. She is a well known dietician and laboratory researcher from Hartford, Connecticut. I thought it would be interesting to hear her ideas on the subject of the rice diet and its effect on diabetes. Following is a communication sent me by this patient:

"Since Insulin was first discovered in 1923 by the late Sir Frederick Banting, a world famous Canadian physician, there has come to be the belief among the laity that diabetes is now one of humanity's thoroughly understood and conquered diseases—that the newly discovered case of diabetes, as well as that of long standing, has merely to take a daily injection of the miracle drug and his or her diabetic troubles are at an end. Would that this were so! Yet the truth of the matter is that, wonder worker and life giver that it is, Insulin is not the *final* answer to diabetes and its attendant ills.

"Until of comparatively recent date it has been the common theory that the failure of one of the body's organs called the pancreas was the reason for the improper utilization of carbohydrates by the diabetic. But at this writing results of extensive research work in many fields point plainly to the fact that in diabetes it is not only the pancreas that is at fault, but that the whole metabolism of the body is involved—the liver in particular, the endocrine and ductless glands, the pituitary, etc. Much more information must be gathered, new and more cleverly devised tests must be perfected, to permit the closest study of the body's functional and chemical secrets before this one disease alone can be fully understood and its problems be dealt with successfully. In the meantime, even the most adequately controlled diabetic is a far cry from the perfection found in a normal person who has no tendency toward diabetes.

"The daily administration of Insulin is a mechanical ap-

proach to a problem only Nature can perform perfectly. The physician endeavors to balance a planned and measured diet with a carefully computed and measured amount of Insulin. The result is highly satisfactory but not perfect by a wide margin. Diabetes is still often attended, with advancing years in the life of the patient, by vascular damage, retinal hemorrhages, arteriosclerosis, diminished circulation in the extremities, leaving them prone to gangrene, etc. The more perfectly controlled the diabetic, the better his chance of avoiding such ills, but the tendency and the danger are still real.

"Diabetic hypertension is another very real enemy. If untreated or unchecked, retinal hemorrhages, with varying degrees of loss of sight, commonly attend or follow and subsequent damage to the entire vascular system results in loss of kidney function, edema of the extremities and heart failure. Until now this was a black picture. Medical knowledge was sharply limited in its effective treatment of any hypertension and doubly so when complicated by diabetes. Alleviating measures were used, the patient's life restricted and his life expectancy from there on became sharply limited. With the discovery of the rice diet by Dr. Kempner the hypertensive diabetic has received his second chance. To those who, like myself, have already experienced the miracle of Insulin, the rice diet comes as a second breath-taking and awesome experience.

"If you are a diabetic—no matter what your age, duration of your disease or degree of its severity—and are experiencing symptoms or signs of mounting blood pressure which does not yield to a modified salt-poor fat-poor diet, then the rice diet is designed for you. If your physician informs you that because of your diabetic condition the rice diet is *not* indicated in your case, then he is either misinformed or uninformed and should take steps to correct both. It has already been determined through the study of many cases of diabetes now being treated by the rice diet that the blood sugars show a marked lowering and that the diabetic on the rice diet who is also taking Insulin is able to reduce his dose and in some instances, discard Insulin altogether.

"Let there be a warning, however, inserted at this point—*Unless frequent checks of the patient's blood and urine chemistry are possible the rice diet should not be undertaken. It is a risky*

business for the layman to embark on any dietary program alone. It is especially risky in the case of the diabetic."

Incidentally, this patient arrived in Durham on a stretcher, and after months on the rice diet she was well enough to drive her car home to Connecticut. She is now on a modified rice diet and uses no insulin. She feels better than she has in years.

THE KEMPNER DIET

The Kempner diet is a relative newcomer among diets. For the short time of its existence it has won many advocates. Physicians have found that rice and the diet's drastic curtailment of fluid intake, the strict low sodium intake, and rest, did much to make a sufferer from hypertension more comfortable.

"The treatment of hypertensive vascular disease with the rice diet[1-5] was suggested by observations made on the protein, fat and carbohydrate metabolism of isolated kidney cells under various pathologic conditions (cell injury and/or changes in pH, sodium bicarbonate concentration, oxygen tension and metabolizable substrate).[6-11]

"Until 1944 the consensus was that dietary treatment was useful in kidney disease but of no value in hypertensive vascular disease. The diet in uncomplicated hypertension requires no essential change from the normal. There is no justification for restriction of protein intake, indeed, such restriction may result in anemia and other evidences of malnutrition. Likewise, in the absence of edema or paroxysmal dyspnea, the restriction of salt is unwarranted; claims that such restriction may lower the blood pressure have not been substantiated. Obesity should be avoided for the same reasons that apply to normal individuals. . . . No dietary treatment is known which has a specifically favorable effect on essential hypertension.[12]

"The rice-fruit-sugar diet is more rigid than any of the fat-poor, salt-poor or protein-poor hypertension diets. The rice diet contains in 2,000 calories not more than 5 gm. of fat and about 20 gm. of protein derived from rice and fruit and not more than 200 mg. of chloride and 150 mg. of sodium. A patient takes an average of 250 to 350 gm. of rice (dry weight) daily; any kind of rice may be used provided no sodium, chloride, milk, etc. has been added during its processing. The rice is boiled or steamed in plain water or fruit juice, without salt, milk or fat. If the

sodium concentration of the plain water available is greater than 20 mg. per liter, distilled water should be used. All fruit juices and fruits are allowed, with the exception of nuts, dates, avocados and any dried or canned fruit or fruit derivatives to which substances other than white sugar have been added. Not more than one banana a day should be taken. White sugar and dextrose may be used ad libitum; on an average a patient takes about 100 gm. daily but, if necessary, as much as 500 gm. daily should be used. Tomato and vegetable juices are not allowed. Usually no water is given and the fluid intake is limited to 700 to 1,000 cc. of fruit juice per day. Supplementary vitamins are added in the following amounts: vitamin A 5,000 units, vitamin D 1,000 units, thiamine chloride 5 mg., riboflavin 5 mg., niacinamide 25 mg., calcium pantothenate 2 mg. No other medication is given unless it is specifically indicated.

"During the first period of regulation on the diet, the patient should be under constant medical supervision and blood and urine chemistry should be checked frequently."*

* Treatment of Hypertensive Vascular Disease with Rice Diet, by Walter Kempner, M.D., Durham, North Carolina. *American Journal of Medicine*, Vol. IV, No. 4, April 1948. The Yorke Publishing Company, Inc., New York.

* From the Department of Medicine, Duke University, School of Medicine, Durham, N. C. This work was supported by grants from the Anna H. Hanes Research Fund, The Life Insurance Medical Research Fund and The Herman Horneman Research Fund.

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TABLE COMPILED BY KEMPNER*

URINARY EXCRETION (GM. IN 24 HR.) ON NORMAL DIET AND ON RICE DIET

	Normal Diet	Rice Diet (2 months) or more)
Total nitrogen	15.0	2.3
Urea nitrogen	12.0	1.1
Uric acid nitrogen	0.3	0.08
Total creat, nitrogen	0.6	0.4
Ammonia nitrogen	0.6	0.1
Sodium	4.0	0.01
Potassium	2.0	3.0
Chloride	7.0	0.1
Inorganic phosphate	1.0	0.3
Total sulfate	0.80	0.13
Inorganic sulfate	0.72	0.08
Ethereal sulfate	0.08	0.05

Salt-poor, Fat-poor Diets

"For many years lax 'salt free' diets containing 2 to 4 gm. of sodium chloride continued to be used therapeutically and with generally disappointing results. More recently with adoption of strict low salt diets furnishing no more than 1 gm. of salt per day, theraputic benefits similar to those previously reported have been observed. Laboratory control is indispensable for accuracy. Actual sodium analyses are not feasible except in specially equipped institutions, but fortunately a simplified method permits adequate checks of the chloride excretion by any practitioner."**

It was found by many physicians working with salt free diets containing 2 to 4 gm. salt that no beneficial results were obtained because the salt intake was too high. The more recent adoption

* Kempner, W.: *Am. J. Med.*, April 1948. The Yorke Publishing Co. Inc., New York.

** J. M. Bryant, V. Lob, G. L. Phillips, and E. E. Blecha. *Ibid.*, 140, 67C (1949).

of strict low salt diets furnishing no more than 1 gm. of salt a day or less gives good results.

The test for salt in the urine is indispensable in maintaining a salt-free diet.

Several regimens in popular use which are as free of salt as a diet can be unless prepared in a special metabolic kitchen are the Karrell, Schemm and Kempner diets. The Karrell diet is useful for periods up to one week. The Schemm and Kempner diets have been of great help in selected cases. However, these diets are deficient for those to be treated over long periods of time and few patients will adhere to them over a protracted period. The diet should approximate as far as possible the dietary routine of the patient's family and community; it should be palatable, flexible and economical.

For chronic cases, we append the following two diets.

Salt-Poor, Fat-Poor Diet*

General Rules:

Add no salt to foods.

Boil, steam, stew, roast, broil, or bake meats, potatoes, etc., do not fry in fat.

Avoid:

1. All fats, like cream, butter, margarine, vegetable shortening, lard, drippings, oils.
2. All fat foods like fresh or cured pork and pork products (such as ham, bacon, sausage, fatback, salt pork, etc.), lamb or mutton (except for very lean cuts from leg or shoulder); salmon, tuna fish, mackerel, sardines; duckling, goose, or fat hen; fat chicken broth or fat meat broth, gravies; mayonnaise, salad dressing; nuts, olives, cheese, chocolate.
3. All salty foods like corned or dried beef; herring or codfish; pickles, ketchup, chili sauce, barbecue sauce, etc., crackers, potato chips, canned soups.
4. Brain, kidneys, liver.

* Note that this is a Salt-Poor, Fat-Poor Diet; it is not a Salt-Free, Fat-Free Diet. It is used at Duke University, Durham, N. C.

EAT:

All fresh vegetables, especially the green leafy kind and tomatoes, carrots and sweet peppers; all fruits; cereal, spaghetti, macaroni, noodles, rice, corn meal, corn starch, potatoes; sugar, honey, syrup, jello; lean beef, veal, young chicken, fish (except the kinds listed above); buttermilk, cottage cheese.
No canned vegetables.

EAT IN LIMITED AMOUNT:

Very little sweet milk (preferably skimmed).
Not more than two eggs a week.
Bread—not more than one slice a day.

SALT-POOR DIET

The following diet, by Dr. Plotz, is a very much more liberal one than Dr. Kempner's. It should not be used in circumstances calling for a calculated diet. But it is of value in those chronic cases in which rigid diets are eventually rejected.
All foods must be cooked without salt.

Foods Allowed:

Cereals
Cream of wheat, farina, oatmeal, puffed rice, puffed wheat, shredded wheat. Noodles, macaroni, spaghetti, farfel, egg farfel, egg barley. Sauces not to be used unless approved.

Breads
Unsalted uneeda biscuits, unsalted matzos.

Vegetables
All fresh vegetables cooked without salt. Nutra diet canned vegetables permitted. Avoid gas-forming vegetables (see below). Rice permitted freely.

Soups—Vegetable soup prepared without salt.

Meats and Fish
All fresh meat and fresh fish prepared without salt. Jelly may be added. Avoid smoked, pickled, fish and meat. No canned fish.

Eggs permitted.

Meat Substitutes

Pot cheese, farmer cheese, eggs prepared without salt and unsalted nuts.

Desserts

Ice cream, ices, custard, jello, junket, sponge cake, apple-sauce, fruit and rice pudding.

Fruit

All fresh or stewed fruits permitted. Fruit juices permitted.

Miscellaneous

Sweet butter, jelly, honey, karo, maple syrup. No molasses.

Beverages

Tea, coffee, milk, cocoa, pure tomato juice, ginger ale, coca cola, all liquids to be calculated as part of the fluid allowance if fluids are restricted. Tomato juice cocktail not permitted.

Do not add salt to food in cooking or at the table.

Take no laxatives unless specifically permitted.

Use no bicarbonate of soda, baking soda, or rhubarb and soda.

In the absence of salt, the following condiments may be used in limited amounts to make foods more palatable: red, black, and white pepper, vinegar, oil, dry mustard, magoram, sage, thyme, tarragon, allspice, paprika, parsley, celery seeds, garlic, grated raw onion, sugar, horse-radish if home prepared, lemon, lime, nutmeg, mace, ginger, curry, sour salt (U.S.P. citric acid), vanilla and other concentrated flavoring.

Do not eat: (1) salt prepared mustard; (2) smoked meat or fish; (3) any cheese except pot cheese or farmer cheese; (4) gas-forming vegetables such as cabbage, cauliflower, turnips, radishes, brussels sprouts or endive.

Beer and other alcoholic beverages are forbidden, unless prescribed by your physician.

M. Plotz, M.D., *New York State J. Med.*, 49: 1349, 1949.

HYPERTENSION

Dr. David Ayman of Boston, one of today's outstanding authorities, has the following to say concerning the present research status of hypertension.*

"It seems clear that the complications and mortality of hypertensive vascular disease have not as yet been strikingly decreased, despite the glowing reports of the successful dietary, surgical and other treatments of hypertension. The failure to reduce the complications of hypertension must therefore be due, as some claim, to an inadequate or incorrect utilization of the foregoning treatments by members of the medical profession or, as others claim, at least in major part due to the weaknesses and therefore failure of the effect of the treatments themselves. My purpose is to point out a few of the many weaknesses of the studies reported and therefore explain the high incidence of success in the studies, and the high incidence of failures in repeat studies with adequate controls.

"The chief reason for the constant arrival and subsequent discard of new treatments for hypertension has been lack of adequate control studies before and after treatment."

When a patient's blood pressure is being taken, he is well aware that he is being tested. He also knows that upon these readings depends his physician's diagnosis. The very procedure itself tends to cause the patient's blood pressure to increase.

Essential hypertension is usually defined as a disease characterized chiefly by a persistent elevation of the blood pressure without known organic cause. This elevation of blood pressure may occur in young persons.** The disease*** may exist without

* Ayman, David.: Surgery and Diet in Hypertension, *J.A.M.A.*, 141: 14, Dec. 3, 1949.

** Alvarez, W. C.: Blood Pressures in Fifteen Thousand University Freshmen, *Arch. Int. Med.*, 32: 17, July, 1923.

Diehl, H. S., and Sutherland, K. H.: Systolic Blood Pressures in Young Men, *Arch. Int. Med.*, 36: 151, Aug., 1925.

*** Ayman, D., Normal Blood Pressure in Essential Hypertension, *J.A.M.A.*, April 19, 1930, p. 1214.

symptoms for many years, and frequently is not discovered until a cerebral hemorrhage or cardiac insufficiency develops. It is now widely recognized that a disease with such an insidious course can be diagnosed only by routine determinations of the blood pressure at all ages. It is not generally realized, however, that essential hypertension may exist when a normal blood pressure has been observed on one visit.

First let us see the blood pressure variation table of Hunter and Frost and determine what our normal blood pressure should be.

The Average Variations of Blood Pressure Based on 250,000 Determinations (after Hunter and Frost)*

Age	Systolic	Diastolic	Pulse Pressure
10	103	70	33
15	113	75	38
20	120	80	40
25	122	81	41
30	123	82	41
35	124	83	41
40	126	84	42
45	128	85	43
50	130	86	44
55	132	87	45
60	135	89	46

High blood pressure is a disease in which the pressure within the blood vessels of the body is so great that there is danger of their rupture with subsequent hemorrhage. The disease may be associated with chronic nephritis (kidney disease), diseases of the blood vessels (as hardening of the arteries, etc.), or heart disease. It is a condition which should be taken seriously by the patient.

In a study of 6,366 women over the age of 40, it was discovered that between the ages of 40-49 the incidence of hypertension was 39.2 per cent and between the ages of 50-59, it was 64.8 per cent.** In this study, blood pressure readings of 140 systolic and 90 diastolic or over were considered indications of hypertensive disease. These investigators also found that the

* Frost, H. M.: Hypertension and Longevity, *M. & S. J.*, 193; 241, August 6, 1925.

** Master, A. M., Marks, H. H. and Dack, S.: Hypertension in People Over Forty, *J.A.M.A.*, 121: 1251, 1943.

incidence of hypertension in women rose precipitously between the ages of 40 and 60, faster than in men.

The average age of the menopause is considered to be about 47, but a variation of seven or eight years either way is not unusual. Thus roughly the age of the onset of the menopause is placed between 40 and 55, years during which the incidence of hypertension is at its height.

"The period of life during which the menopause appears," state Page and Corcoran,* "is also the one in which essential hypertension is most likely to occur. Little wonder, then, that clinicians have imputed a specific causative role to the menopause, and that the term 'menopausal hypertension' is in common usage.

"Loss of ovarian secretions," Page and Corcoran aver, "does not of itself cause or predispose to essential hypertension. The hypertension of the menopause seems to be a true essential hypertension, probably accentuated by the emotional turmoil of the period."

The emotional influence of hypertension can not be overestimated. Pyschosomatic symptoms, whatever their initial origin, can cause pain, or stimulate fear and apprehension to such a degree that there is a constant bombardment of the mechanism, thus causing the increase in blood pressure. Fear in animals will cause increased blood pressure and general muscular tension. If a pattern is established over a long enough period, whether it is fear, uncertainty, apprehension or any of the other allied emotions, recent research indicates "these functional conditions, if long continued, may progress to true organic conditions,** especially in the sphere of the visceral organs. The emotional influence on the alimentary canal was described by Cannon.*** Others**** have pointed out that the emotional stress imposed upon the individual by modern living conditions may be a major factor in causing functional disorders.

S. K. Robinson of Chicago, in his discussion of essential

* Page, I. H. and Corcoran, A. C.: Arterial Hypertension: Its Diagnosis and Treatment, Chicago Year Book Publishers, 1945, pp. 54-55.

** J. A. Naia: *Psychosomatic Med.*, 10: 120, March-April, 1948.

*** W B. Cannon: *Am. J. Med. Sc.*, 137: 480, April, 1909.

**** C. W. Lueders: *Arch. Int. Med.*, 42: 282, August, 1928.
**** H. E. Ruggles: *Calif. & Western Med.*, 29: 221, October, 1928.
**** G. W. Slagle: *J. Mich. Med. Soc.*, 41: 119, February, 1942.

hypertension, gives an excellent survey of the present general situation of hypertension, in the following statement:

"I think that progress is now being made, especially after hearing the presentation by Dr. Wilkins and his co-workers. A good many of you undoubtedly heard Dr. Wakerlin's presentation. I want to repeat a statement he made: 'Ninety per cent of essential hypertension is of nonrenal origin.' That is of tremendous importance. As long as one has the idea that a primary disease like hypertension can be produced by a vegetative organ like the kidney, there will not be much progress in hypertension. The next differentiation I would like to make is between high blood pressure and hypertension. High blood pressure can be produced by the injection of various substances, or by ligation of the renal artery and is not the same disease as occurs in human beings. The experimenters have produced high blood pressure. Hypertension is not entirely a question of hemodynamics; it may involve distant organs and systems. When the hypertensive patient comes to the doctor he may complain of dizziness, dyspnea, fatigue, and according to certain workers, these symptoms can be solved by psychotherapy. Other symptoms and signs may be edema, high basal metabolic rate—and let me say here that no examination of the hypertensive patient is complete without a basal metabolism test—impending cardiac failure, anemia and diabetes. First and foremost in therapy is weight reduction. The rice diet contains only about 20 grams of protein, and one cannot keep a patient on that diet very long without injury to the liver. Shemm's diet for edema, with the water thrust, is very effective. The elevated pulse rate responds, according to Bram, to treatment with neostigmine bromide. It is necessary that one discover hypertension early, before the patient comes to the doctor with blood pressure of 200 or so. By the routine measuring of the blood pressure the hypertensive patient with a blood pressure of 160 or so can be discovered. The early conditions respond better. There are two syndromes that are frequently associated with hypertension: the gastrocardiac syndrome and the so-called hyperthyroid hypertension. In treatment of the former, the avoidance of gassy foods is helpful. In hyperthyroid hypertension the elevated basal metabolic rate is more easily reduced than the hypertension; useful aids are vitamin A in large doses

and, as mentioned before, neostigmine bromide, and propyl thiouracil. When all methods fail, the use of roentgen rays to the sympathetic chain and the pituitary may give good results."*

Variations of Blood Pressure

Blood pressures vary not only in the sick, but also in those free from disease. Dr. Ayman summarizes the hypertension situation as follows:**

"Many years ago I reemphasized the well known but still neglected fact that variations of blood pressure levels in essential hypertension is one of the outstanding clinical characteristics of the disease,*** and as of now, 1950, the clinical characteristics of this disease have not changed. All patients with either mild or severe hypertension have constant variations of blood pressure levels. In general, the upward fluctuations of blood pressure are usually due to emotional reactions, either pleasant or unpleasant; and the drops in levels are associated with emotional relaxation and calmness. The variations may amount to extremes of 100 mm. systolic and 40 mm. diastolic during the course of minutes. A constant state of emotional perturbation may often cause a relatively constant higher level of blood pressure until the perturbation is erased or decreased. Thus, there is no reason why it may not last for days or weeks. A momentary emotional disturbance may cause a rise in blood pressure for only a moment. Thus there is no way of knowing that a hypertensive patient has a basal relaxed level of blood pressure merely by taking repeated blood pressure readings every few minutes until a constant level is attained—one must take into account the emotional state of the patient at the time."

Before anyone can be told that he needs 1500 or 2000 calories a day to keep in good condition physically, many factors must be taken into consideration. For example, where does he

* Wilkins, R. W., Freis, E. D. and Stanton, J. R.: Essential Hypertension, *J.A.M.A.*, May 21, 1949. Discussion by Dr. S. K. Robinson.

** Ayman, D.: Critique of Reports of Surgical and Dietary Therapy in Hypertension. Read before the Section on Iinternal Medicine at the Ninety-eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 9, 1949.

*** Ayman, D.: An Evaluation of Therapeutic Results in Essential Hypertension: II. The Interpretation of Blood Pressure Reduction, *J.A.M.A.* 96: 2091 (June 20) 1931.

live? If he lives in a warm climate he will need less food than in a moderate climate. Cold weather, on the other hand, necessitates eating to stay warm. The kind of food no longer is in question, only the quantity. The colder it gets, the more of every kind of food men need. "Food intake in the Arctic fluctuates with the wind chill factor, ranging from a daily average of 5,600 calories a day in April to 5,900 in February, the coldest month. Contrary to the popular impression, the ratio of fats to proteins and carbohydrates remains exactly the same."*

So here we have several new factors to consider in addition to those appearing on the weight charts. You cannot be arbitrary as to what a person should weigh. His occupation must be taken into consideration and his rate of metabolism also. This is one of the strongest objections to the caloric method of diet prescribing.

The hypertensive patients need a great deal of psychotherapy. They need reassurance that if they stay on a diet, salt free or otherwise, they will get results.

Emotional calm in the patient must be reestablished. A drop in blood pressure will result spontaneously, with rest, after peace of mind has been obtained. Most hypertensives have a history of some marital, familial or vocational maladjustments dating back for years. They are usually active people, quite mentally alert and sensitive. They react quickly to outside stimuli whether favorable or unfavorable.

When a man becomes enraged his face usually becomes flushed and, if he has high blood pressure, he is liable to precipitate a stroke. Any sudden emotional stimulant can result in a rise in blood pressure and can be dangerous.

As there is no doubt that the patient's psychology has much to do with the exacerbations in blood pressure, it is essential that a calm frame of mind be maintained by the patient at all times. The cooperation of the patient's famiy must be obtained in this matter. If this is impossible, then the patient should be advised to change his environment.

Recently we had concrete evidence that the human emotions play a great part in the hypertension picture.

* Lagemann, John Lord: Operation Musk Ox, *Collier's Magazine*, N. Y., Feb. 12, 1949.

Ade T. Milhorat, Oskar Diethelm and M. Fiele Fleetwood, of the Payne Whitney Psychiatric Clinic at the New York-Cornell Medical Center, reported* progress in their work on chemical changes in the blood in emotional conditions. Diethelm asserted that they were approaching a point of quantitative estimation.

Their method is to take samples of blood from patients in states of anxiety, tension and resentment, and apply it to rabbit muscle. The muscle is found to react differently according to the condition of mind of the patient. Blood from an anxious person relaxes the muscle, that from a tense one contracts it, and there is another specific reaction for resentment.

Hans Seyle of the University of Montreal, gives a very good explanation as to how emotional stresses affect the human being and set a vicious physiologic mechanism into motion. Fear, anger, or any similar human emotion causes the pouring of secretions or hormones from the endocrine glands into the bloodstream. We know, for example, that fear causes a rise in blood pressure. If a person is in a constant state of fear or insecurity, the body will adjust itself to a higher blood pressure and will establish a pattern which will then become a new normal for that particular person. To accommodate this increased demand for greater amounts of secretion, the adrenal gland will hypertrophy so as to be able to supply a constant flow of the secretion.

Seyle calls his theory the General Adaptation Syndrome.

The General Adaptation Syndrome**

"In response to long-continued stress of any kind, certain protective physiologic mechanisms are set in motion. The endocrine glands, particularly the pituitary and adrenal, contribute prominently to these defense reactions.

Although primarily beneficial, excessive or abnormal reactions to stress may cause diseases of adaptation; hypertension, nephrosclerosis, and rheumatic diseases are examples.

Seyle divides the general adaptation syndrome into the

* Report at the twenty-ninth annual meeting of the Association for Research in Nervous and Mental Diseases, at the Hotel New Yorker, December 2, 1949.

** The general adaptation syndrome and the diseases of adaptation. *Practioner*, 163: 393-405., 1949.

alarm reaction, the stage of resistance, and the stage of exhaustion (FIG. 1).

Agents which cause local damage evoke only slight alarm reaction. Cold, exercise, roentgen radiation, infections, and intoxications produce severe alarm reactions.

The alarm reaction follows sudden exposure to a noxious stimulus. Phenomena of shock occur, such as hypotension, hemoconcentration, hypothermia, increased capillary permeability, and central nervous system depression.

Resistance to the specific stimulus and to other damaging stimuli is decreased. Countershock phenomena, notably enlargement of the adrenal cortex and hypersecretion of corticotropins and corticoid hormones, also occur.

Usually shock and countershock are associated.

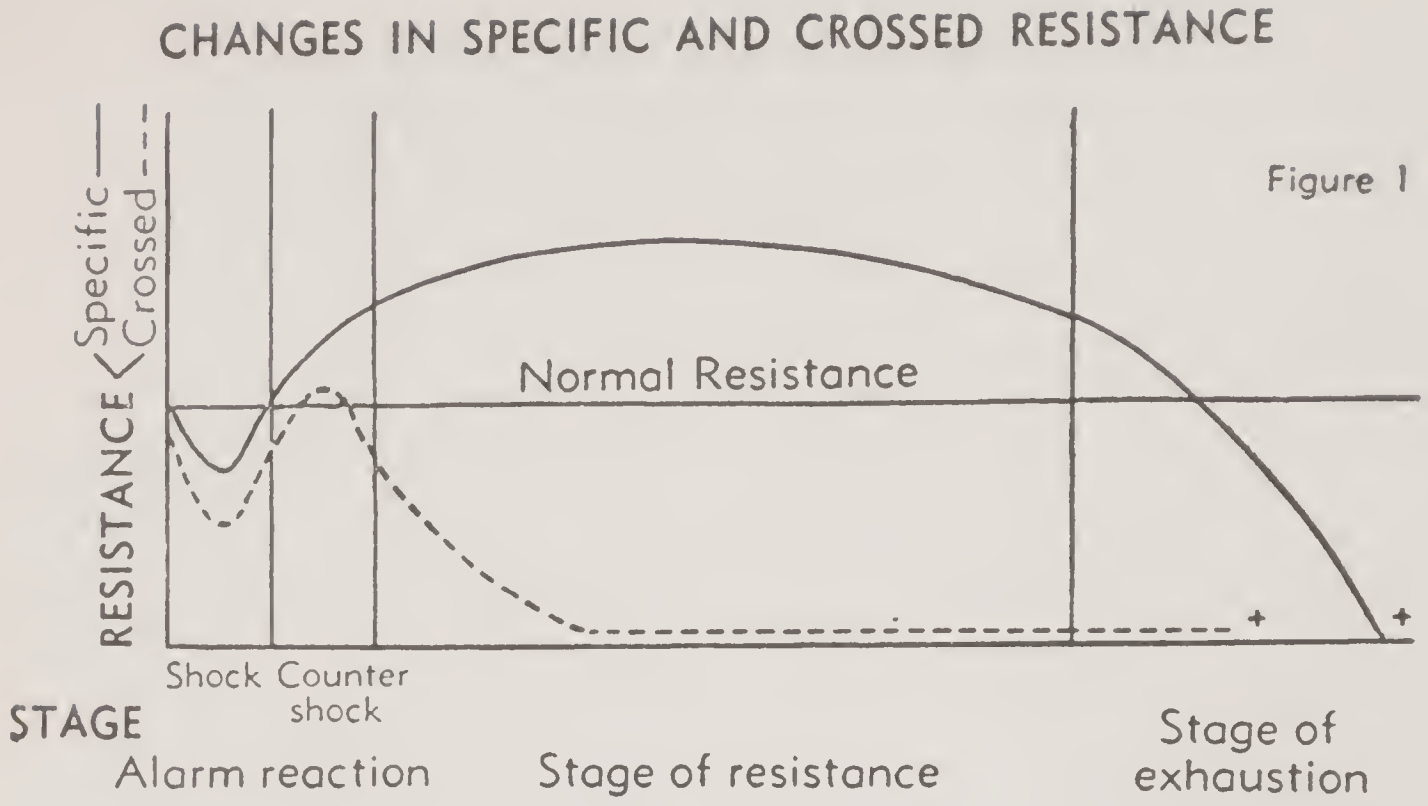
Continued stress after adaptation develops leads to the stage of resistance. Resistance to the specific stimulus increases but with loss of antagonism to other damaging agents. If adaptation fails, the stage of exhaustion ensues with collapse of all defense and eventual death.

The manner by which stress initiates the chain reactions of adaptation is unknown, but two courses may be assumed (Fig. 2). One leads to shock, possibly through nervous stimuli, deficiencies, or toxic metabolites. The other, the defense mechanism, depends upon activities of the hypophysis and adrenal glands.

The hypophysis liberates excessive amounts of corticotropic hormones, and other hypophyseal secretions are decreased. The consequence is gonadal involution and cessation of somatic growth. In response to corticotropin, the adrenal cortex enlarges and secretion of cortical hormone is augmented.

The organic corticoids produce changes in organic and inorganic metabolism, as well as atrophy of the thymus and other lymphatic tissues, and increase hypertensinogen production. The latter reacts with renin to form hypertensin, a vasopressor substance.

The inorganic corticoids cause retention of sodium with resultant increase in blood volume. This plethora contributes to elevation of blood pressure.



The inorganic corticoids also induce renal nephrosclerosis, probably by reason of sodium retention. Renal pressor substances such as renin are produced in excess, presumably as a result of diminution of glomerular blood flow due to nephrosclerosis. A vicious cycle is then set up: Nephrosclerosis aggravates hypertension and hypertension provokes nephrosclerosis.

The mineral-corticoids may also damage the tubules, which cannot then inactivate renin. This circumstance would contribute another factor to inducement of hypertension and nephrosclerosis. Aschoff nodules or infarcted areas may develop in the heart.

The chief clinical implication of the general adaptation syndrome is that disease may result from the prolonged exposure to nonspecific damaging stimuli. How hypertension could thus be caused is apparent. The same may be said for nephrosclerosis, and possibly for nephritis and rheumatic disease. The particular manifestation in which endogenous hormonal intoxication appears clinically is probably determined by heredity, diet, and other factors."

FUNCTIONAL INTERRELATIONS DURING THE GENERAL ADAPTATION SYNDROME

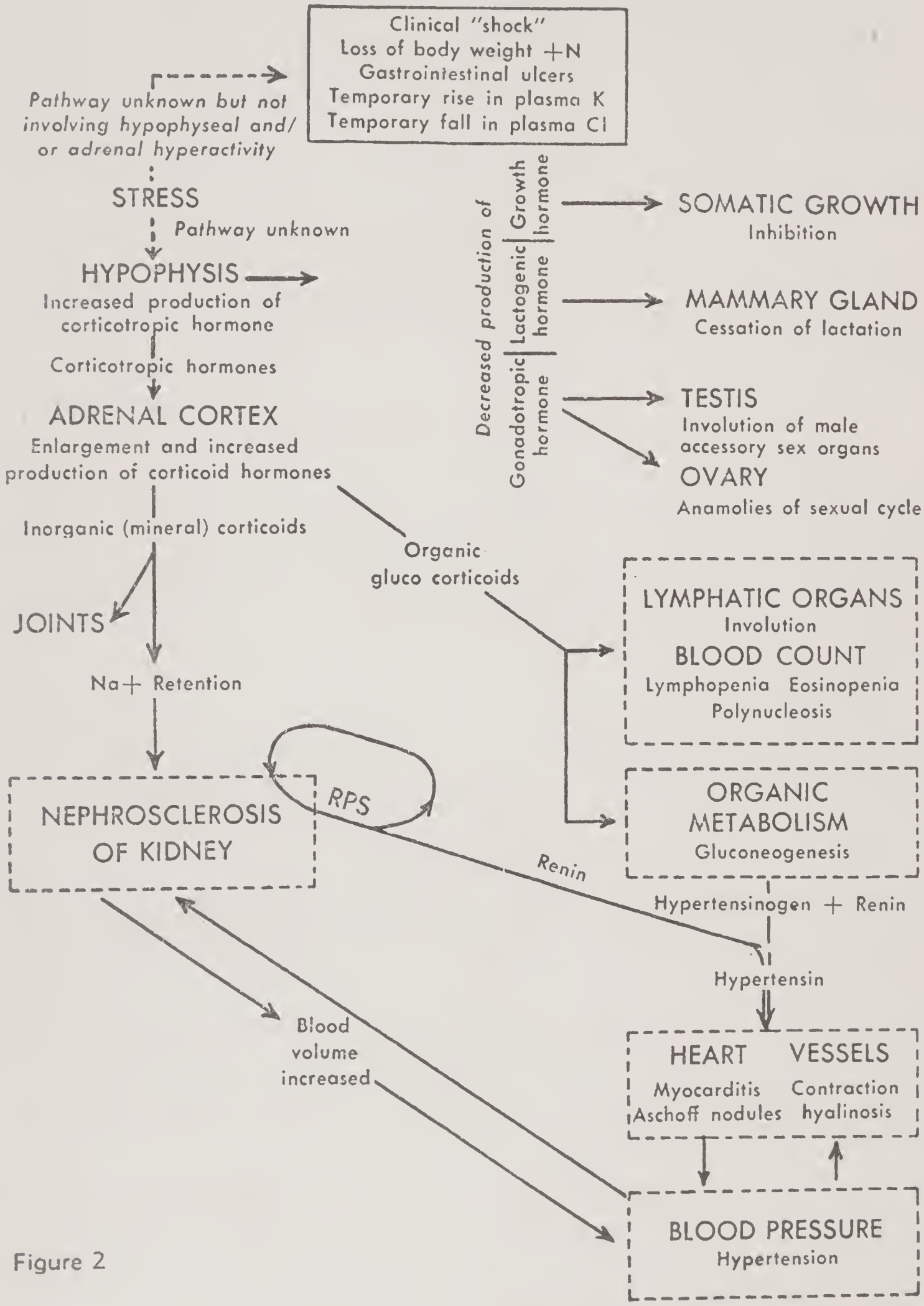


Figure 2

RULES

Below is a composite list of the rules to be followed by patients suffering from high blood pressure—(based on research observations made by specialists in the field).

Get plenty of sunshine.

Rest—never get physically or mentally tired.

Avoid arguments.

Seek cheerful companions—be cheerful yourself.

Keep your salt-free diet as prescribed by your physician.

Take supplementary vitamin therapy.

Take citrus fruits daily.

Walk daily, but do not tire.

No smoking—it increases blood pressure.

Use no salt substitutes—many have caused death.

Seek a warm climate in winter.

Use no cathartics. (In case of severe constipation use 5 grains of cascara sagrada. Prune juice taken daily is the best regulator).

Use no drugs, sleeping powders, etc., unless prescribed by your physician. (Many drugs contain sodium).

Use no dental powder or tooth paste unless found to be free of sodium by your physician.

Avoid radio-programs, movies, or any stimulating pastimes which are overly exciting.

Avoid undue eyestrain.

If overweight, reduce.

CASE HISTORIES

Including a discussion of the patient's background, disease, and the dietary controls employed.

HYPERTENSION, ACCOMPANIED BY OBESITY

Neither obesity nor hypertension is a sudden development. They are the result of years of psychological traumas, in which the patient has been futilely fighting domestic or business situations, or other combination of circumstances, which are distasteful or traumatic to his spirit. To relieve this inward tension, the patient will often develop a harmful habit, such as overeating, which is one of the commonest and easiest emotional outlets for inward tensions. This sets up a vicious cycle, which goes on and on, until something snaps and the patient is brought to a sudden realization that his body is no longer functioning properly.

The more the patient overeats, the greater grows his appetite, and, of course, the more his weight increases. This puts an ever greater burden on the heart, which has to pump harder and harder to cope with the ever increasing resistance developed by the blood vessels imbedded in fat. This in turn limits the ability of the blood vessels to dilate properly. With the years, the blood pressure increases, until it reaches the upper brackets of safety, and finally, usually due to some added or aggravated emotional stress or strain, the blood pressure exceeds the safety zone and the patient reaches the breaking point.

The following case history illustrates the above points. As a young girl, Mrs. A. struggled hard to make a living for herself and three younger sisters. She became considerable of a go-getter, and when, in her early thirties, she married the man she fell in love with, she was bitterly disappointed to discover that he was of the easy-going type, perfectly content to plod along in his minor job. He was a kind and devoted husband, perfectly satis-

fied with both his home life and his job. But Mrs. A. was an ambitious woman, and for years she tried, by prodding and cajoling, to make a successful business man of her husband. But he continued on in his usual calm way, and little by little, she developed a frustration complex, giving vent to her feelings by overeating. She gained weight rapidly and considerable emotional tension developed by the time she reached her menopause. She became irritable, and when her blood pressure reached 230, she developed retinal hemorrhages and became blind. Her hypertension — for which she had not been treated — had caused a slow oozing of the blood into her eyegrounds.

She underwent a series of tests, and her physician prescribed the Basic Rice Diet. At the end of three months, the retinal hemorrhages had been absorbed and she had regained her eyesight. Her reduction in weight was as dramatic as the restoration of her eyesight. Since then (two years ago) she has been on a Modified Rice Diet; her weight is within the normal bounds for her height and age, and she has had no further trouble with her eyes. It may, of course, be necessary for this patient always to remain on the Modified Rice Diet.

The pituitary gland, often called the master gland, is susceptible to emotional stimulation — fear, anger, frustration, anxiety. All cause an over-stimulation of the pituitary, which in turn governs the secretion of the adrenal glands.

On January 28, 1950, Dr. Hans Selye was able to announce the "christening" of a new hormone of the adrenal gland, which he called desoxy-cortisone (Reichstein's compound). This hormone is produced in greatly increased amounts by the pituitary gland when a person becomes angry or frightened; is mentally overworked; has a feeling of being "driven" in a highly competitive field; suffers from an inferiority complex; is engaged in an uncongenial occupation; is worried by financial obligations; or, in short, is confronted by any unpleasant situation, especially if of long duration.

All surgical operations are shocks to the nervous system; the apprehension which precedes an operation is a shock in itself.

Of course, the most common of the strains and stresses are the family arguments, business feuds, marital incompatibilities that form so large a part of life. Selye recognizes these traumatic shocks to the nervous system, and advocates, as far as is possible, the avoidance of all additional nervous shocks, such as loud street noises, shrill-ringing bells, and raucous sounds of all types.

CEREBRAL HEMMORRHAGE

The following case history is a good example of the results that follow when the mental and emotional strains and stresses become too great. Mrs. B., a successful professional woman, had married at the age of 34. She soon found herself living in a tense atmosphere, trying to keep the peace among their parents, the child and the husband, and at the same time, continued to work hard at her law practice. Although she and her husband loved each other, they almost lost sight of the fact in the constant

family bickering. As an escape, eating became an ever increasing form of pleasure and relaxation, and she gained weight rapidly.

This situation went on for years, and finally, soon after the menopause, her blood pressure began reaching the higher brackets —200/120 and 240/140. Signs of deterioration began to appear — extreme irritability; swelling of the ankles at the close of day, and excessive urination, especially at night.

At the age of 50, she suddenly had a cerebral hemorrhage, became unconscious and also blind. She was, of course, immediately hospitalized, and the enforced rest reduced the pressure behind the hemorrhage sufficiently to allow clotting at the site of the break of the small blood vessel in the brain. At the end of three days, she recovered consciousness, and her eyesight returned, but she had lost her power of speech and her sense of coordination, so that she could not write. It took about three weeks for the clot to reabsorb. By the end of the fourth week, fairly normal speech and locomotion had been regained.

Mrs. B. underwent the necessary tests, and then was placed on the Basic Rice Diet. She improved slowly, but surely—the eye hemorrhages reabsorbed and she lost 55 pounds in three months.

Many of the domestic problems which had kept her in a state of nervous tension have since resolved themselves. Due, partly, to the lessening of the strains and stresses which formerly plagued her, and, partly, to the fact that after three years she still continues on the Modified Rice Diet, both her weight and blood pressure are kept within bounds, and she has regained much of her old time zest for living.

CORONARY THROMBOSIS

Mr. C. was a successful attorney, but his home environment was unhappy. He was disappointed because his only son would not follow the same profession, and his wife (fifteen years younger) was too demanding, both socially and physically. He began to complain of fatigue, dizzy spells, shortness of breath. Upon examination, his physician found the blood pressure readings were 230/140. The patient started to take things more easily and began to feel better. Then one day he indulged in a long walk which was more tiring than he realized. He felt a sharp pain in his chest and collapsed. When he was hospitalized, the diagnosis was coronary thrombosis. Good care, complete rest and the Basic Rice Diet brought about his recovery sufficiently so that he could return to his office. He reduced his working hours to six per day. He now follows the Modified Rice Diet faithfully, and feels that he can once again look forward to a useful life.

KIDNEY DISEASE

At the age of 26, Mrs. D. had a history of child-bed fever after the birth of her second child. Both of her kidneys were impaired, and her life became that of an invalid. By the time she was 36, her weight had increased to 206 pounds; she had high blood pressure, and her blood cholesterol level was constantly above normal. She was kept on a low-salt, low-fat diet for years, but it proved of little benefit in her case. Then an attack of pneumonia sent her to the hospital. When she recovered, it was found that her kidneys were further impaired, and she was kept in bed for three months.

Finally, she was placed on the Basic Rice Diet, and within a short time a definite improvement was noticeable. A month later, she was able to take ten-minute walks three times a day. She improved steadily under the Basic Diet, and three months later was allowed to go on the Modified or Augmented Rice Diet, which she still follows. When she played her first nine holes of golf again — a game she loved, but whilch had been forbidden her for about 12 years — she felt that she had finally left her invalidism behind her.

ARTERIOSCLEROSIS

Arteriosclerosis is due to deposits of lipids or fats in the lining of the arteries. The older one becomes, the more apt he is to develop this disease. About a quarter of the population have this condition, in varying degrees, between the ages of 40 and 50; between the ages of 50 and 60, nearly one-half the population is affected, and of those over 70, nearly four-fifths are afflicted to a greater or lesser degree.

Mr. E. had been a hard-working young salesman until he acquired his own business at the age of 37, and started leading an inactive existence — managing his business from a comfortable chair; attending big luncheons; using his car for a distance of even a block, etc. At the age of 53, danger signals started to appear — he became very pale; suffered from headaches, abdominal cramps, nervousness and constipation. Suddenly, he became paralyzed on his left side; his face was drawn to one side and his speech was a jumble of sounds, which were not understandable.

He was placed on the Basic Rice Diet. Massage of the paralyzed side was begun. Slowly, he recovered the partial use of his left hand; then he was allowed to use a crutch. His wife encouraged him to start reading aloud to her. At first, his attempts at reading aloud were torture to both him and his wife, but little by little, his reading improved, as did his use of the left hand, and his management of the crutch.

He remained on the Basic Rice Diet for nearly three and one-half months, supplemented, of course, with the necessary vitamins. Then he was allowed to go on the Modified Rice Diet. He improved steadily, and a year after his attack the paralysis had left him and he was able to return to business. He is still on the Modified Rice Diet, and may have to remain on it for the balance of his life. But, to him, this seems a small price to pay for the blessing of an active, normal life.

Another case is that of Mr. F., aged 73, who had been suffering for several years from dizziness, throbbing headaches, indigestion, and a sensation of falling. He weighed 110 pounds; his blood pressure was 204/110, he had "pipestem" arteries. His physician made a diagnosis of arteriosclerosis with marked cardiac enlargement and placed him on the Basic Rice Diet. He started losing weight, at the rate of about a pound a week, until he reached a low of 101 lbs. He felt very weak, but his digestion improved markedly, and the dizziness decreased slowly, as did the sensation of falling. At the end of three months, he was put on the Modified Rice Diet, and commenced to regain his lost weight, returning to his normal 110 pounds. None of the symptoms have returned to date (two years later). The blood pressure readings are normal; he is able to take short walks, visit his friends, and, for the first time in many years, he can say: "I feel more like my old self again."

The Ricer's general attitude towards the Rice Diet is interestingly summed up in an Ode written by Agnes S. de Lambert. Lest the Ricer be too discouraged by the opening stanzas, let him concentrate on the closing ones!

THE RICE DIET

An Ode To Dr. De Bault & Dr. Tola

Reprinted from the Journal of the American Medical Association

I

Rice and fruit
Some fruit and rice
It's hard to flavor
To make it nice.

II

Boiled or steamed,
Fresh fruit or canned,
Pep up with lemon
Brown sugar banned.

III

Use no fat
And use no salt;
But as for honey,
There is no halt.

IV

Sugar, white
Just heaps each day
Not so for water
Oh! no! Nay! Nay!

V

Liquids, yes,
But not too much
A thousand c.c.'s
Of juice and such.

VI

Vitamins
One pill at each
With lunch and dinner
The goal to reach.

VII

Watch the weight
The kidneys too
Keep down the pulse beat
Don't fret or stew!

VIII

Tests for this
Then tests for that,
As Mrs. Pao says:
"Oh, Dear, My Hat!"

IX

Read a lot,
Then rest some more,
To down that B.P.
Almost a bore.

X

Problems tough
For all the staff
Poor dietitian
She cannot laff.

XI

Teeth soon hurt,
The Tummy's mad,
It's hard to keep, then,
From feeling sad.

XII

Hold on, tho
It must be done!
When low's the pressure.
The battle's won.

XIII

Wish me luck
It's thanks to you,
I feel much better
Almost like new.

XIV

Goodby now,
I'm off to rest
If I must diet,
I'll do my best.

Agnes S. de Lambert
Lima, Nov. 10, 1948
"Clinica Americana"

THE RESEARCH STORY OF THE RICE DIET

1901: Ambard and Loeper wrote a paper entitled: "On the retention of chlorides in the tissues of the hearts of certain cases which had died." The tissues contained much more salt than normal. This paper first mentions the possibility that the diseased heart condition resulted from the saturation of the tissues with salt.
(Ambard, C. and Loeper, M.: *Société de Biol.* 53: 346, 1901)

1904: Ambard and Beaujard read a paper in which they proposed that to control edema, salt should be restricted in the patient's diet in cases of hypertension.
Ambard and Beaujard: *Arch. gen. de med.* 81: 520, 1904).

1906: Ambard was still convinced that the ascites and the retention of body fluids in the cases of hypertension were due to the retention of salt in the tissues and so reported. The basic theory was the theory of chloride retention.
(Ambard: *Sem. med.* 26: 361, 1906)

1920: A preliminary report by Allen of 20 cases, after observing a case of congestive heart failure with severe edema for which the rational treatment appeared to be rigid exclusion of salt. An improvement of the associated hypertension was noted. He was the first to establish the relationship that cases of retinitis, congestive heart failure and puerperal eclampsia were among the diseases which benefitted by salt poor diets.
(Allen, Frederick M.: *J.A.M.A.*, 74: 652, 1920)

1922: Allen and Sherrill reported the findings on a group of 180 cases over a period of 4 years, which group included hypertensive cases without edema. Both the cases with edema and without edema responded to a diet in which salt was rigidly excluded.
Allen's paper of 1922 was a surprise to the medical profession here in America and caused much debate. He stated clearly that salt is a specific aggravating factor in a specific disease, essential hypertension, the progressiveness of which can be controlled by eliminating this factor. This is comparable to the control of progressiveness in diabetes by control of the sugar.
(Allen, F.M. and Sherrill, J.W.: The Treatment of Arterial Hypertension, *J. Met. Res.* 2: 429-545, Oct. 1922)

1923: Among the early workers were O'Hare and Walker, who published a paper in August, 1923, entitled Salt in Vascular Hypertension. They found that restriction of the salt intake would reduce random blood pressure readings in some patients. They, like Allen, believed hypertension was due to the chloride intake and did not suspect the sodium ion was the real culprit. They found that diets low in salt were beneficial.

(O'Hare, J.P., and Walker: Salt in Vascular Hypertension, *Arch. Int. Med.* 32: 283, Aug. 1923).

1930: Ayman states that "I have given placebos to hypertensive patients and obtained 80% symptomatic improvement."

Ayman points out that warm climates are better suited to patients suffering from cardio-vascular disease. In Florida, for example, these patients do very well. Ayman notes that "a spell of warm, humid weather often results in lowered readings."

(Ayman, D.: An Evaluation of Therapeutic Results in Essential Hypertension: 1. The Interpretation of Symptomatic Relief, *J.A.M.A.* 95: 246, July 26, 1930).

1930: Goldblatt demonstrated that blood pressure was intimately related to the kidney function.

1939: Of 218 cases of essential hypertension, Schroeder and Steele classified 43 as being of endocrine origin, hypertension beginning at the time of the menopause in nine cases.

These groups need to be considered separately, before we can be sure that they are homogeneous as to personality functioning. There are different types of essential hypertension (neurogenic, endocrine, renal, mixed, etc.).

(Schroeder, H.A. and Steele, J.M.: Studies on Essential Hypertension; Classification, *Arch. Int. Med.* 64: 927, 1939).

1939: Fishberg was of the opinion that there is a close relationship between the disturbances in vasomotor regulation and menopausal hypertension. "That climateric disturbances in vasomotor control and hypertension," he states, "are actually due to loss of ovarian function is shown by those cases in which they follow operative or Roentgen castration in relatively young women; while hypertension appears in only a decided minority of such cases, it is nevertheless not extremely rare. . . . How the loss of ovarian function results in vasomotor disturbances and hypertension is not known . . . while the administration of large doses of estrogenic substance is followed by considerable fall in blood pressure. Far more often this is not the case."

(Fishberg, A.M.: Hypertension and Nephritis, 4th ed., p. 587, Lea and Febiger, Philadelphia, 1939).

1941: In discussing congestive heart failure, Schroeder stated: "The early

workers with the low salt diets concerned themselves with the salt content, and later with the sodium content, of the food in the daily diet, but failed to consider the salt or sodium content of the drinking water."

(Schroeder, H.A.: Studies on Congestive Heart Failure: Importance of Restriction of Salt as Compared to Water. *A. Heart J.* 22: 141-153; Aug. 1941).

1941: Furstenberg and his associates reported that failure in the treatment of Meniere's disease with a low salt diet was due to the high sodium content in the drinking water. They corrected this by substituting water with low sodium content.

(Furstenberg, A.C., Richardson, G., and Lathrop, F.D.: Meniere's Disease: Addenda to Medical Therapy, *Arch. Otolaryng.* 34: 1083-1092; Dec. 1941).

1942: Schemm's article points out the necessity for limiting the fluid intake. Details and basis of regime are given.

(Schemm, F.R.: High Fluid Intake in Management of Edema, Especially Cardiac Edema, *Ann. Int. Med.* 17: 952-969; 1942).

1944: Kempner, in a series of four papers in 1944, advocated a strict diet for the treatment of kidney disease and hypertensive vascular disease. This diet was based on a lower salt intake than had been used heretofore in low sodium diets.

Kempner's statistics stress that to lose both visible and invisible marked edema no medication is necessary—no digitalis, mercurials, etc. are given with the administration of the rice diet.

"Since the first reports on the rice diet (1944)" Kempner writes, "the importance of the rigid restriction of protein, fat, sodium and chloride has been stressed. Up to that time the therapeutic effect of this diet on blood pressure, heart size, electrocardiogram, eyegrounds, non-protein nitrogen, edema, etc., had been determined in 150 patients with acute and chronic nephritis and hypertensive vascular disease."

(Kempner, Walter: Treatment of Kidney Disease and Hypertensive Vascular Disease with Rice Diet. *North Carolina M. J.*, 5: 125-133; 273-274; 1944. Also, *J.A.M.A.*, 125: 48 & 60, 1944).

(For a detailed bibliography of Dr. Kempner's work with rice, see pages 163-165).

1944: Fishberg considers essential hypertension as a "collective concept for a number of conditions having in common the positive characteristics of arterial hypertension and the negative one of the absence of primary renal disease."

(Fishberg, A.M.: Hypertension and Nephritis, 4th ed. Lea and Febiger, Philadelphia, 1939).

1944: Goldring felt that the dietary treatment was useful in kidney disease but of no value in hypertensive vascular disease. He stated "The diet in uncomplicated hypertension requires no essential change from the normal. There is no justification for restriction of protein intake, indeed, such restriction may result in anemia and other evidences of malnutrition. Likewise, in the absence of edema or paroxysmal dyspnea, the restriction of salt is unwarranted; claims that such restriction may lower the blood pressure have not been substantiated. Obesity should be avoided for the same reasons that apply to normal individuals and not because of any demonstrated relationship to hypertensive disease".

(Goldring, W. and Chasis, H.: Hypertension and Hypertensive Disease. Commonwealth Fund, p. 169, New York, 1944).

1944: The Schemm and Kempner diets are of great value in carefully selected cases. Both these diets are inadequate for treatment over protracted periods of time.

(Schemm, F.R.: Clinical Observations and Data. *A.I.M.*, 21: 957-976, Dec., 1944).

1945: Grollman and his associates reported that using "less than 1 gm. of sodium chloride" in a diet they noticed a decrease in the high blood pressure in a series of six patients. This group feels that the effect of the rice diet is due to the low sodium content.

(Grollman, A.; Harrison, T.R.; Mason, M.F.; Baxter, J.; Crampton, J., and Reichman, F.: Sodium Restriction in the Diet for Hypertension. *J.A.M.A.* 129: 533-537 Oct. 20, 1945)

1945: Page feels that the real benefits of the rice diet are derived from "rest in bed and the psychotherapy of constant attention."

(Page, I.H. and Corcoran, A.C.: Arterial Hypertension, *Chicago Year Book,* p. 79, 1945).

1945: Perera pointed out that there is considerable evidence that the adrenal cortex plays a part in the regulation of blood levels. Adenomas of the adrenal cortex are associated with the elevation of blood pressure while hypoadrenalism goes hand in hand with hypotension. Furthermore some patients with this condition with desoxycorticosterone were capable of producing hypertension.

(Perera, G.A.: Relationship of Adrenal Cortex to Hypertension, *J.A.M.A.*, 129:537-538; Oct. 20, 1945).

Perera sums it up thus: "The fact that desoxycorticosterone has pressor potentialities raises the question whether the abnormal liberation of certain adrenal cortical hormones may be concerned in the etiology of hypertension even though consistent change is not apparent."

(Knowlton. A. I., Loeb, E. N., Stoesk, H. C., and Seegal, B. C.:

Desoxycorticosterone Acetate, potentiation of its activity by sodium chloride, *J. Exper. Med.* 85: 187-198; Feb. 1947).

1946: Herndon stated "it has been known for a long time that not only is the menopause associated with well marked disturbances in vasomotor control but that hypertension often appears at this time. However, since this hypertension is not relieved by the injection of estrogenic substances, and since it appears in only a relatively small fraction of women, it seems fair to conclude that it occurs only in those who have a hereditary tendency to hypertension which becomes manifest with the loss of ovarian secretion."
(Herndon, R.F.: An Introduction to Essential Hypertension, Charles C. Thomas, Springfield, Illinois, 1946).

1946: Experimentally, the effect of salt on the kidneys was shown by Selye and Stone in 1946. See page 29.

1947: Goldblatt reported his observations as follows: "Of the endocrine organs, the only one that may possibly play a significant, even if secondary, part in hypertension is the adrenal, although this conclusion is contested on the basis of inadequate evidence."
We know there is lack of evidence due no doubt to our limited knowledge of endocrine secretions.
(Goldblatt, H.: Renal Origin of Hypertension, *Physiol. Rev.* 27: 120-165, Jan. 1947).

1947—Perera has shown that there is a significant decrease in early morning blood pressure readings in a group of hospitalized hypertensive patients in response to diets containing 0.2 to 0.25 gm. sodium. The studies were carefully controlled. They all had normal cardiac and renal functions. No change was noticed in random blood pressure readings on these patients though the "resting" blood pressure readings were consistently lower.
(Perera, G. A. and Blood, D. W.: Relationship of Sodium Chloride to Hypertension, *J. Clin. Investigation,* 26: 1109-1118, Nov. 1947).

1947: Dick and Schwartz tried a rice diet similar to Kempner's on 11 dogs in which they induced hypertension. The diet was supplemented with vitamins and iron. In ten of the eleven dogs there was a significant reduction of blood pressure, going from 181 to 138 (average). These dogs were on the diet for only eight weeks, and then the blood pressure level dropped.
(Dick, G. F. and Schwartz, W. B.: Response of Experimental Hypertension to a Rice and Fruit Juice Diet. *Proc. Soc. Exper. Biol. & Med.* 65: 22, May 1947).

1947: Flipse and Flipse reported favorably on the results obtained by them on the rice and fruit diet.
(Flipse, M. E. and Flipse, M. J.: Observations in the Treatment of

Hypertension with Rice-Fruit Diet, *Southern Med. J.* 40: 721, Sept. 1947).

1948: The blood pressure of laboratory animals was varied by Lenel, Katz and Rodbard by changing the sodium content of their drinking water. Concentrated solutions caused marked increases in blood pressure.
(Lenel, R., Katz, L.N., and Rodbard, S.: Arterial Hypertension in the Chicken. *A. J. Physiol.* 152: 557-562, Mar. 1948).

1948: Schroeder observed in his studies with a low sodium diet in hypertension that the best results were in obese women of menopausal age or in those who had menstrual disturbances. He suggests that "these patients clinically presented the possibility that the adrenal cortical activity is altered with secondary associated hypertension."
(Schrœder, H.A.: Low Salt Diets and Arterial Hypertension, *A. J. Med.*, 4: 578-587, April 1948).

1948: D. G. Simonsen ran the "Determinations of the Sodium Content of Tap Water at the Los Angeles County Hospital." This paper was used by Seymour Cole in 1949 for the basis of his report. See p. 35. (*J.A.M.A.*, 140: 1, 19; May 7, 1949).

1948: Contratto contends controls must be established before a true evaluation can be made of the value of the rice diet per se. Papers to date were written with almost complete disregard of even a mention of controls on the findings.
(Contratto, A.W. and Rogers, M.B.: The Use of the Rice Diet in the Treatment of Hypertension in Nonhospitalized Patients, *New England J. Med.* 239: 531, Oct. 7, 1948).

1948: Emoff proves in his paper that a great deal of salt enters the diet through the drinking and cooking water, especially in districts where the available water has a high saturation point of mineral content.
(Emoff, L.J.: Estimations of Hidden Water and Sodium in the Low Salt Diets. *Western Society for Clinical Research,* Oct. 22, 1948).

1948: Schwartz and Merlis emphasized the drastic aspect of the rice diet insofar as the rice diet is deficient in sufficient protein to maintain life over an extended period of time; and that it is dangerous to patients with impaired renal function.
(Schwartz, W.B. and Merlis, J.K.: Nitrogen Balance Studies on the Kempner Rice Diet, *J. Clin. Investigation* 27: 408, 1948).

1949: Schroeder, Futcher and Goldman investigated the effects of the rice diet upon the blood pressure of hypertensive individuals who were hospitalized for minimum periods of three months. These patients were hypertensives, with normal nonprotein nitrogen blood levels. Before diets were inaugurated, a control period of from 21 to 51 days

was observed so that the blood pressure changes associated with hospitalization and rest alone could be observed.

Then Schroeder administered the rice diet (as prescribed by Kempner) for 16 to 90 days. The sodium content at no time exceeded 0.2 gm. He supplemented the diet with multivitamins and iron (Ferrous sulfate) to prevent anemia.

In his discussion Schroeder states that "a rough estimate can be made that the blood pressure of only about 10% of an unselected group of patients with well established hypertension will fall to normal under the influence of a diet restricted only as to salt."

(Schroeder, H.A., Futcher, P.H., and Goldman, M.L.: Effects of Rice Diet upon Blood Pressure of Hypertensive Individuals. *Annals Internal Medicine* 30: 713-732, April 1949).

1949: Schroeder feels there are four simple mechanical factors that act to maintain either a normal or a high blood pressure.

(1) The heart function.
(2) The volume of the blood.
(3) The viscosity of the blood.
(4) The resistance to blood flow in the periphery.

Schroeder maintains that "the blood pressure can be considered as a resultant of a number of interesting influences, and can become decompensated in a number of ways. It may be as untrue to state that all cases of arterial hypertension have the same basic disturbance as it is to state that all patients with fever have the same etiologic agent."

(Gibbons, M.N.: Current Opinions on the Use of Low Sodium Diet in Hypertension. *J.A.M.A.*, p. 469, Nov. 1949).

1949: Abstract of Discussion by Dr. Allen: "Most physicians remain unaware that the Allen-Sherrill investigation in 1922 included: the first large statistics of dietotherapy in hypertension (with due consideration of protein, weight, psychic and other influences); the first adequately strict exclusion of chloride, bicarbonate and other sodium salts, consequently the first account of salt-deficiency symptoms and precautions against deaths such as recent authors report; the first classification of refractory cases and notice of ultimate benefit in many of them; the first recommendation for retinitis, eclampsia and congestive heart failure, and the first clear concept distinguishing between symptoms and specific disease controllable through a specific factor. The biologic relation of salt to blood pressure and vascular tone is proved beyond question by: (1) abundant confirmations, since my clinical experiments in 1920, that ingestion of salt raises blood pressure in normal and hypertensive animals and persons; (2) causation of experimental chronic hypertension with adrenal and pituitary hormones, particularly

in association with salt (Selye); (3) the converse demonstration, which I first furnished, that the profound vascular atony of shock demands sodium salts, not the plasma proteins of the academic authorties. . . .

"My patients mostly die from coronary or cerebral consequences of arteriosclerosis which antedated treatment. Impressions or statistics of lengthened life, though genuine, are debatable because of natural variability of cases. But about fifty per cent of cases of hypertension ordinarily terminate in congestive heart failure; also, retinitis, claudication, angina and uremia are frequent. Though not all curable after occurrence, my experience teaches that all these are prevented by saltless diet. Since sodium chloride is merely the principal, not the sole, factor, rare exceptions may prove the rule. But my challenge to those who talk about fixed evolution of essential hypertension is that in thirty years I have not seen the mentioned complications arise on continuous saltless diet, even in refractory cases."

(Allen, Frederick M.: Abstract of Discussion—on David Ayman's Critique of Reports of Surgical and Dietary Therapy in Hypertension. *J.A.M.A.* p. 976; Dec. 3, 1949).

1949: According to Bryant, et al, lax salt free diets containing 2 to 4 gms. of sodium chloride continued to be used therapeutically and with generally disappointing results. More recently with adoption of strict low salt diets furnishing no more than 1 gm. of salt per day, therapeutic benefits similar to those previously reported have been observed. Laboratory control is indispensable for accuracy. Actual sodium analyses are not feasible except in specially equipped institutions, but fortunately a simplified method permits adequate checks of the chloride excretion by any practitioner.

(Bryant, J.M.; Lob, V.; Phillips, G.L. and Blecha, E.E.: *J.A.M.A.* 140: 670, 1949).

1949: Henry A. Schroeder and his associates believe that there is a new syndrome with hypertension which represents a pathogenetic entity. The symptoms are as follows:

(1) sudden onset of obesity at menarche, menopause, or after multiple pregnancies or gynecologic surgery,
(2) obesity of central type with pale striae on thighs and upper arms,
(3) menstrual irregularities,
(4) therapeutic response of blood pressure levels to low-salt diets,
(5) low concentrations of sodium and chloride in sweat.

In no instance were the cardinal signs of Cushing's syndrome present.

This is based upon the disturbances of functions of the adrenal cortex which may cause a complex of hypertension, obesity, and menstrual

irregularities. The work was based on the symptoms of 24 women with arterial hypertension which do not, apparently, belong to any previously known syndrome.
(Schroeder, H. A.: *Proceedings Central Soc. Clin. Research* 22: 73, 1949).

1950: Thorn and Bayles reviewed the major metabolic changes induced by the hormones and therapeutic effects of pituitary and adrenal agents. Hormones of the adrenal cortex regulate three broad types of body activity: electrolyte balance, carbohydrate, protein, and fat metabolism, and androgenic or anabolic function.
Electrolyte effects of that gland are retention of sodium and chloride, increased excretion of potassium, and rise of plasma and extracellular fluid volume. The most potent steroid in this field is 11-desoxycorticosterone, which has been synthesized. The circulating hormone is measured indirectly by changes in urine, sweat, hematocrit values, and body weight.
Intermediary metabolism is controlled by both 11- and 11, 17-oxysteroids. The compounds increase blood sugar and liver glycogen, conversion of protein to carbohydrate, mobilization of depot fat, and renal clearance of uric acid. In addition, fixed lymphoid tissue and circulating lymphocytes are reduced and circulating eosinophils almost completely eliminated.
Hormones of this type are Kendall's compounds A (11-dehydrocorticosterone), B (corticosterone), and the far more active 11, 17-oxysteroids, E (17-hydroxy-11-dehydrocorticosterone) and F (17-hydroxycorticosterone). In all but electrolyte effects the 11, 17-oxysteroids are superior to the 11-oxysteroids and 11-desoxycorticosterone. However, in large amounts, either of the 11-17-oxysteroids maintains satisfactory electrolyte balance.
Blood levels of the 11- and 11,17-oxysteroids are determined by fall of circulating eosinophils or rise in the urinary ratio of uric acid to creatinine. The adrenal cortex apparently secretes chiefly compound F. Androgenic and anabolic functions, like those of testicular hormones, masculinize the body and favor retention of nitrogen, phosphorus, potassium, sodium, and chloride. Secretion or administration of androgenic steroids increases urinary 17-ketosteroids.
(Thorn, George W. and Bayles, Theodore B.: Pituitary-Adrenal Function. *Modern Medicine,* Jan. 1, 1950).

1950: Molhuysen and associates, working at the University of Amsterdam, the Netherlands, found that oral doses of a licorice extract cause retention of water, sodium and chloride, and in some cases definite edema. They obtained consistent results in 9 subjects with normal

adrenals. Hemoglobin and total serum protein dropped; venous and pulse pressure and blood pressure rose.
(Molhuysen, J. A. et al. *Lancet,* 259: 381-86, 1950)..

[This is a good example of the unsuspecting hazards lurking in foods, diets and medication. Who would ever suspect licorice —that time-honored vehicle of bitter medicines and the delight of children, and even of adults? Who would ever suspect it of causing trouble for patients suffering with the cardio-reno-vascular diseases?]

SODIUM (Na) AND POTASSIUM (K) ANALYSES OF FOODS

Data for the use of physicians, dietitians and research workers interested in low sodium diets.

(The following analyses were made by the Research Laboratory, Mead Johnson and Company, and are reproduced with their kind permission.)

These data were obtained by flame photometry, believed to represent a new order of accuracy in figures for sodium.

Brand names of manufactured products are given when their use is unavoidable, but in general leading brands are represented.

Natural foods usually contain less sodium than processed foods; thus, fresh peas are almost sodium-free, but canned, frozen and dry split peas contain large amounts of added sodium.

As a rule, fresh foods of vegetable origin contain little sodium, while foods of animal origin contain much sodium, even when none is added.

Values for potassium are included for the benefit of research workers interested in the role of this element.

The tables show the number of milligrams of sodium and of potassium in 100 grams of food. Only the edible portion of the various foods was taken into consideration. And, unless otherwise described, fresh, uncooked material was used.*

* From the Mead Johnson Foreword.

SODIUM (Na) AND POTASSIUM (K) ANALYSES OF FOODS

FOOD	*Na, Mg. per* 100 *Gm.*	*K, Mg. per* 100 *Gm.*
Allspice, ground	62	680
Almond	2	690
Almond, roasted in oil and salted	160	710
Anchovy paste	12,000	1,900
Apple juice (sweet cider), bottled	4	100
Apple, less skin	0.1	68
Applesauce, canned	0.3	55
Apricot	0.5	440
Apricot, canned in sirup	2	65
Asparagus, spears, canned	400	130
Asparagus, tips	2	240
Asparagus, tips, frozen	3	320
Avocado	2	340
Bacon	760	95
Bacon, fried crisp	3,200	450
Banana	0.1	400
Barley, pearled	3	160
Bean, Great Northern, dry	0.3	1,400
Bean, green	0.8	300
Bean, green, canned	410	120
Bean, green, frozen	2	110
Bean, Lima	1	680
Bean, Lima, canned	310	210
Bean, navy, dry	0.9	1,300
Beef, corned	1,700	400
Beef, dried	3,900	1,000
Beef, less excess fat	53	380
Beer	8	46
Beet	110	350
Beet, canned	36	120
Beet leaves	130	570
Blackberry	0.2	150
Blueberry	0.5	89
Bouillon cube	27,000	1,500
Brain, pig	150	340
Brandy	3	4
Brazil nut	0.8	650
Brazil nut, roasted in oil and salted	190	730
Bread, low sodium, (made with Lonalac)	2	120
Bread, low sodium, cinnamon roll	2	120
Bread, Passover. See matzoth	.....	.....
Bread, rye and wheat	560	100
Bread, semi-whole-wheat	670	300
Bread, wheat, white	670	130
Bread, whole wheat	430	210
Broccoli	16	400
Brussels sprouts	11	450
Brussels sprouts, frozen	9	300
Butter, average salted. Theoretical value based on U.S. average salt content of 2.5%	980	.....
Butter, lightly salted	780	16
Butter, unsalted	5	4
Buttermilk, cultured	130	140
Cabbage	5	230
Cantaloupe	12	230
Caraway seed	16	1,400
Carrot	31	410
Carrot, canned	280	110
Cashew nut	13	560
Cashew nut, roasted in oil and salted	200	560
Catchup, tomato	1,300	800
Catfish (fiddler)	60	330
Cauliflower, bud	24	400
Cauliflower, bud, frozen	22	290
Caviar, salmon	2,200	640
Celery salt	26,000	3,100
Celery, seed	140	1,400
Celery, stalks	110	300
Cereal, bran	1,400	1,200
Cereal, wheat, Instant Ralston	1	360
Cereal, wheat, Maltex	4	250
Cereal, wheat, Pettijohn's	2	380
Cereal, wheat, Wheatena	1	380
Cheese, American Swiss	420	110
Cheese, cheddar	540	130

FOOD	*Na, Mg. per 100 Gm.*	*K, Mg. per 100 Gm.*
Cheese, cottage	320	80
Cheese, cream	340	90
Cheese, process	1,500	440
Cheese, whey (cheese food)	1,500	520
Cherry, dark sweet	1	260
Cherry, dark sweet, canned in sirup	0.7	77
Cherry, dark sweet, frozen in sirup	1	280
Cherry, light sweet, canned in sirup	3	55
Chestnut	2	410
Chicken, breast meat	78	320
Chicken, leg meat	110	250
Chocolate, milk	86	420
Chocolate sirup	60	130
Chocolate, unsweetened	4	830
Cider, sweet (apple juice)	4	100
Cinnamon, ground	8	200
Citron, candied	290	70
Clam	180	240
Coca-Cola (soft drink)	1	52
Cocoa, powder, Dutch process	55	3,200
Cocoa, powder, ordinary, Hershey	4	1,400
Coconut, dry, shredded	16	770
Cod	60	360
Cod, frozen fillets	400	400
Cod liver oil	0.1	0
Cod, salted	7,200	80
Coffee, roasted	2	1,600
Corn flakes	660	160
Corn meal, yellow, enriched	0.6	120
Corn oil	0.2	0.1
Corn, popcorn, popped and oiled	3	320
Corn, popcorn, popped, oiled and salted	1,500	340
Corn starch	4	4
Corn, sweet white, canned	200	200
Corn, sweet white, milk stage	0.2	240
Corn, sweet yellow, canned	210	200
Corn, sweet yellow, frozen	9	190
Corn, sweet yellow, milk stage	0.3	370
Corn, yellow, 5 varieties, dry	0.4	290
Cowpea	1	560
Crab, canned	1,000	72
Cracker, Graham	700	440
Cracker, soda	1,500	500
Cranberry	1	65
Cranberry sauce, canned	1	17
Cream, whipping (32% fat)	40	56
Cucumber, less parings	0.8	230
Currant	2	160
Currant, Zante, dried (Zante raisins)	22	730
Curry powder	45	1,300
Dandelion	76	430
Date, semi-dry	0.9	790
Dextrin	14	14
Dextrose	1	0.4
Dill, seed	12	1,000
Duck, domesticated, breast meat	68	360
Duck, domesticated, leg meat	96	210
Egg	140	130
Egg, whites only	200	140
Egg, yolks only	34	85
Eggplant	0.8	190
Endive	18	400
Farina	0.8	88
Farina, quick-cooking enriched	100	95
Fig	2	190
Fig, canned in sirup	1	110
Fig, dried	33	780
Filbert	0.8	560
Flour, bleached, enriched, Gold Medal	1	86
Flour, bleached, enriched, phosphated	13	78
Flour, buckwheat	1	680
Flour, gluten	2	24
Flour, rye, dark	1	860
Flour, white, natural	1	120
Fruit cocktail, canned in sirup	9	160
Garlic	6	510
Gelatin dessert, dry	330	210
Gelatin, plain, dry	27	11
Gin	0.7	0.3
Ginger ale	8	0.6
Ginger, ground	29	1,100
Gizzard, turkey	58	170
Gluten, wheat	2	24

FOOD	Na, Mg. per 100 Gm.	K, Mg. per 100 Gm.
Gooseberry	0.6	87
Grape juice, Concord, sweetened, bottled	1	120
Grape, Thompson Seedless	4	180
Grapefruit	0.4	200
Grapefruit juice, sweetened, canned	0.4	150
Gravy flavoring	86	280
Halibut	56	540
Ham, less excess fat	2,100	610
Hash, corned beef, canned	880	380
Heart, beef	90	160
Heart, turkey	69	240
Hominy, canned	180	50
Honey	7	10
Horse-radish, prepared	96	290
Ice cream, vanilla	100	90
Jam, grape	7	78
Kale	110	410
Kidney, beef	210	310
Lamb, less excess fat	110	340
Lard	0.3	0.2
Lemon, less rind	0.6	130
Lettuce, head	12	140
Litchi, dried	3	1,100
Liver, calf	110	380
Liver, pig	77	350
Liver, turkey	51	160
Lobster, boiled in tap water	210	180
Lonalac	20	1,200
Lonalac, reliquefied	2	160
Macaroni	1	160
Mace, ground	45	180
Maize.. See corn	.....	.....
Maple sirup	14	130
Marmalade, orange	13	19
Matzoth, American style	360	130
Matzoth, egg	16	160
Matzoth farfel	28	130
Matzoth meal	4	125
Matzoth, Passover	1	140
Matzoth, plain	1	140
Matzoth, poppy seed	350	140
Matzoth, tasty wafer	430	260
Matzoth, thin tea	2	130
Matzoth, whole wheat	280	420
Mayonnaise	600	17
Milk, buttermilk, cultured	130	140
Milk, dialyzed. Replaced by Lonalac	.....	.....
Milk, evaporated	100	270
Milk, goat	34	180
Milk, human, from 9 mothers, 3 to 10 days postpartum	40	64
Milk, human, from 4 mothers, 49 to 77 days postpartum	11	51
Milk, malted	440	720
Milk, whole, dry	410	1,100
Milk, whole, liquid	51	140
Molasses, cane	80	1,500
Mulberry	0.6	200
Mushroom	5	520
Mushroom, canned	470	260
Mustard greens	48	450
Mustard, powder	3	840
Mustard, prepared paste	1,100	280
Nutmeg, ground	14	160
Oats, rolled	2	340
Okra, pods	1	220
Oleomargarine	1,200	230
Olive, green pickled	2,200	290
Olive oil	0.2	0.2
Olive, ripe pickled	920	240
Onion, white	1	130
Orange	0.2	170
Orange Crush (soft drink)	2	100
Orange juice, unsweetened, canned	0.4	190
Oyster, fresh	73	110
Pancreas, pig	57	240
Paprika, powder	82	2,300
Parsley	28	880
Parsnips	7	740
Pea	0.9	380
Pea, canned, less liquor	230	180
Pea, dry split	42	880
Pea, frozen	100	160
Peach	0.1	180
Peach, canned in sirup	6	31
Peach, frozen in sirup	3	120
Peanut butter	120	820
Peanut oil	0.2	0.1
Peanut, roasted in oil and salted	460	700
Peanut, roasted in shell	0.8	740
Pear, Bartlett	2	100
Pear, canned in sirup	8	52
Pecan	0.2	420

FOOD	Na, Mg. per 100 Gm.	K, Mg. per 100 Gm.
Pepper, black, ground (spice)	16	880
Pepper, green (vegetable)	0.5	170
Pepper, red, ground (spice)	46	2,400
Pepper, white, ground (spice)	5	48
Persimmon, wild	0.8	310
Pickle, dill	2,300	330
Pilchard, See sardine		
Pineapple	0.3	210
Pineapple, canned in sirup	1	120
Pineapple, frozen in sirup	1	38
Pineapple juice, unsweetened, canned	0.4	140
Plum	0.1	140
Plum, canned	18	110
Pomegranate, juice and pulp	0.3	200
Popcorn, popped and oiled	3	320
Popcorn, popped, oiled and salted	1,500	340
Pork, less excess fat	58	260
Pork, salt	2,900	260
Postum (cereal beverage), dry	36	1,300
Postum, instant, dry	71	2,200
Potato chips	240	880
Potato, sweet, canned	48	200
Potato, sweet, less skin	4	530
Potato, white, canned	350	240
Potato, white, less skin	0.6	410
Poultry seasoning	26	840
Pretzel	1,100	330
Prune, canned in sirup	3	220
Prune, dried	5	600
Prune juice, unsweetened	2	260
Pumpkin	0.4	480
Pumpkin, canned	2	240
Quail, breast meat	35	160
Quail, leg meat	11	190
Quince	0.6	290
Rabbit, domesticated, foreleg	47	370
Rabbit, domesticated, loin	34	400
Radish, with skin	8	260
Raisin, seedless	21	720
Raisin, Zante	22	730
Raspberry, black	0.2	190
Raspberry, oriental (wineberry)	0.8	170
Raspberry, red	0.4	130
Rhubarb, stalks	1	70
Rice flakes	720	180
Rice, puffed	0.8	100
Rice, polished and coated	2	130
Rice, vitaminized	4	170
Rum	2	3
Sage	19	670
Salmon	48	410
Salmon, canned	470	330
Salt, common. Theoretical value for pure NaCl	39,342	0
Sardine (herring), canned in oil	510	560
Sardine (pilchard), canned in natural sauce	760	260
Sardine (pilchard), canned in tomato sauce	400	320
Sauerkraut, canned	730	490
Sausage, Bologna	220	84
Sausage, Frankfurt	1,100	330
Sausage, pork	1,100	440
Shortening, vegetable, Crisco	4	0
Shortening, vegetable, Spry	0.4	0.2
Shrimp	140	220
Sirup, chocolate	60	130
Sirup, maple	14	130
Sirup, sorghum	20	600
Sirup, table (corn-and-cane)	83	24
Soda, baking. Theoretical value for pure $NaHCO_3$	27,373	0
Sorghum sirup	20	600
Soup, beef, canned. Diluted as served	400	244
Soup, tomato, canned. Diluted as served	400	440
Soup, vegetable, canned. Diluted as served	150	170
Soybean, dry	4	1,900
Soy flour, solvent-extracted	0.6	1,700
Spaghetti. See Macaroni		
Spinach	190	790
Spinach, canned	300	260

FOOD	*Na, Mg.* per 100 *Gm.*	*K, Mg.* per 100 *Gm.*
Spinach, frozen	60	330
Squash, acorn	0.3	260
Squash, Hubbard	0.2	240
Squash, yellow summer	0.5	200
Squash, white summer	0.2	150
Starch, corn	4	4
Strawberry	0.7	180
Strawberry, frozen, sweetened	2	180
Sugar, light brown	24	230
Sugar, white	0.3	0.5
Tangerine	2	110
Tangerine juice, sweetened, canned	0.6	170
Tapioca, granules	5	19
Tea, India-Ceylon-Java blend	4	1,800
Thyme, whole	36	500
Tobacco, chewing	1,600	1,800
Tomato	3	230
Tomato, canned	18	130
Tomato juice, canned	230	230
Tongue, beef	100	260
Tripe, pickled	46	19
Tuna, canned	540	480
Turkey, breast meat	40	320
Turkey, leg meat	92	310
Turmeric	21	2,700
Turnip, leaves	10	440
Turnip, white	37	230

FOOD	100 *Gm.* per *Na, Mg.*	100 *Gm.* per *K, Mg.*
Turnip, yellow (rutabaga)	5	260
Vanilla extract	1	74
Veal, less excess fat	48	330
Vinegar, cider	1	100
Vinegar, distilled	0.6	15
Walnut, black	2	460
Walnut, English	2	450
Water, carbonated, I	18	0.6
Water, carbonated, II	1	0.6
Watermelon	0.3	110
Wheat flakes	1,000	540
Wheat germ, containing some bran and flour	2	780
Wheat gluten	2	24
Wheat, puffed	3	340
Wheat, shredded	2	340
Wheat, winter	2	430
Whisky, blended	0.3	1
Whisky, bonded	0.1	0.6
Wine, port	4	75
Wine, sauterne	10	87
Wineberry	0.8	170
Worcestershire sauce	1,400	360
Yeast, compressed	4	360
Yeast, debittered, dry	180	1,900
Yeast, primary cultured, dry	8 to 320	2,000
Zwieback	250	170

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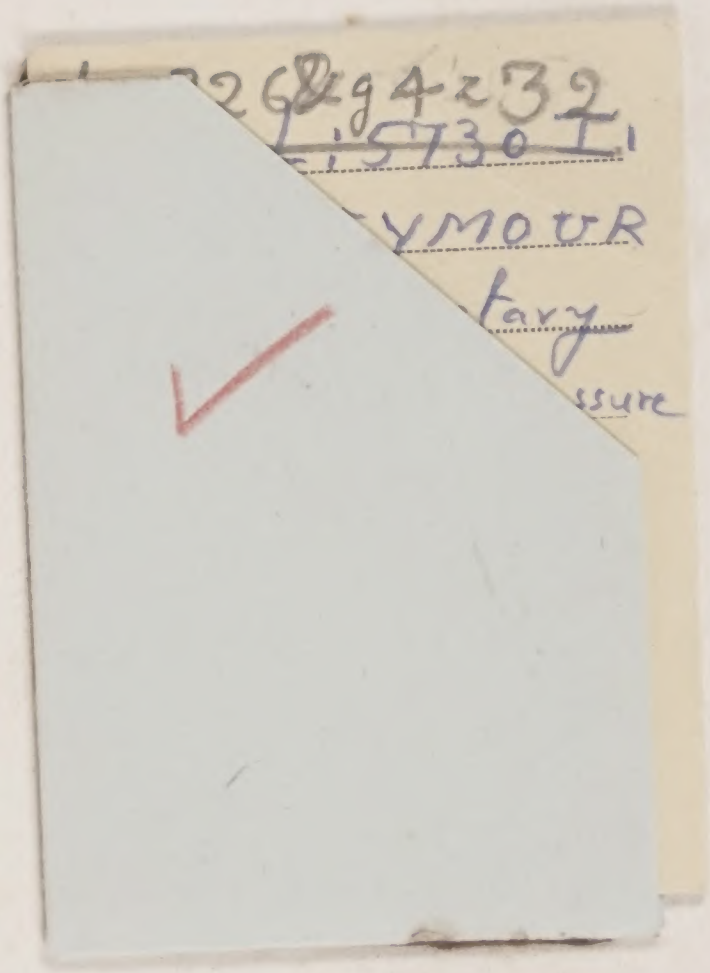
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